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PROSPECTIVE INCENTIVE PAYMENT EXPERIMENT

PHASE 1: FINAL REPORT

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This report was prepared under a contract between the Social Security Administration, HEW and the California Hospital Association. The views and opinions expressed in the report are the contractor's and no endorsement by the Social Security Administration or HEW is intended or should be inferred. The project officer for this contract was Alfonso Esposito, a staff member within the Division of Health Insurance Statistics, Office of Research and Statistics.

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Contract Number 600-75-0165

FINAL REPORT

PROSPECTIVE INCENTIVE PAYMENT EXPERIMENT
PHASE I

June 30, 1976

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The California Hospital Association is indebted to a large number of individuals and organizations for this project's successful completion. Particular appreciation is expressed to the individuals who generously served on the three committees involved in the project.

The Project Advisory Committee, representing a wide spectrum of health care interests in California, provided policy direction in addition to valuable technical input. This Committee spent long hours deliberating the project's directions and methods. The Committee members demonstrated substantial devotion to the project's goal of developing a sound hospital industry regulatory system and viewed the problem from two perspectives: (1) the overall public interest; and (2) how their individual organizations would fit into the proposed system.

The CHA Committee on Research and Development provided the industry input to the project. These Committee members also spent many hours evaluating the project and dealt with highly controversial issues in a responsible and farsighted manner.

The CHA Ad hoc Committee on Financial Requirements and Rates provided invaluable technical advice, substantially augmenting staff's resources. This Committee also, while representing industry interests, provided a broad perspective and addressed the public interest issues that must be

accommodated in a sound regulatory program.

The consultants involved in the project, Brian Emory, Paul Jerdin, Professor Carl Hopkins and Professor Martin Ross made valuable technical contributions to the project. Brian Emory is owed a special debt of gratitude for agonizing through the early phases of the project and offering many innovative ideas that significantly affected this final package.

We would like to express particular appreciation to the CHA Board of Trustees for sponsorship of the project and to other CHA staff for advice and comments.

GRC
HWZ

EXECUTIVE SUMMARY

This Final Report describes work performed on the Prospective Incentive Payment Experiment, a fifteen-month contract from the Social Security Administration to develop a budget and rate review system for California hospitals.

Budget and rate review criteria are intended to promote individual hospital and industrywide efficiency and productivity advances while providing equity in payment (to payers and providers) and recognizing the relationship between cost, access and quality.

The further project objective was development of a protocol for implementation of the above criteria through a live experiment in the second phase (July, 1976 through June, 1979).

1. Need For Proposed System

Rapidly escalating costs of health care is a matter of public concern and specific alarm on the part of government, which now accounts for 40 percent of total health expenditures and 50 percent of hospital expenditures. This has generated governmental efforts at the federal and state levels to contain their program costs. Rather than encouraging more efficient delivery of services and therefore cost savings to the general public, these efforts have been largely inconsistent, resulting in cost shifts from government to private health care consumers. This imbalance between government and private payments is worsening and appears to provide no incentives to hospitals to contain their costs.

This project addresses the need for a comprehensive, coordinated regulatory system implemented in a phased manner beginning with a regional experiment. Such a system will benefit the general public in addition to government, which pays for certain patients from tax funds. By necessity, this system must deal with redundancy of hospital facilities and services and provide powerful incentives for efficient delivery of health care, both within the single institution and industrywide. With regard to the latter, hospital expenditures should be evaluated on an aggregate basis determine the reasonableness of aggregate expenditures in a community and efficient allocation of these expenditures among hospitals.

The system recommended in this report considers the following:

(1) cost containment for the entire industry;

(2) financial viability for the industry;

(3) equity among purchasers of hospital services; and

(4) integration of budget and rate review with other, complementary, regulatory activities.

Central to the approach recommended here is the concept that consumer expectations are infinite and resources are finite. This requires the ability of a regulatory agency to evaluate aggregate expenditures for the prospective year prior to reviewing and approving individual budget proposals. This mechanism is also essential from the point of view of government programs which must be budgeted well in advance of the hospital budget period.

The health industry places a high priority on equity in payment among purchasers, adequacy of payment and predictability.

Similarly, government authorities place high priority on predictability and control. The concept of a statewide aggregate expenditures forecast accommodates both these needs.

Another essential component of this recommended system is a strong planning and certificate of need program consistent with the economic objectives discussed above. Sole reliance on rate-setting functions, given the peculiar characteristics of the medical care market, is likely to result in a distribution of services and facilities that is not sensitive to the public interest and evolves through a form of cutthroat competition.

In summary, steadily tightening economic constraints on the health system are obvious as is the need for a comprehensive and coordinated regulatory program that recognizes these economic constraints in the public interest. The system recommended here is designed to explicitly address these needs.

2. General Description

This project has resulted from two years of extensive negotiations with Social Security Administration representatives. The original intent was to undertake a prospective payment experiment involving payment to a sample of hospitals. Budgets and rates were to be approved by the California Health Facilities Commission; all payers (Titles XVIII and XIX, Blue Cross, commercial insurance, and other payers) were to pay Commission-approved rates. However, Social Security Administration officials required development of clear ground rules for budget and rate review prior to committing Medicare funds. Thus, this one-year

developmental contract was awarded instead of the original proposal. A provision in the developmental contract called for development of a proposal for an experiment, which was submitted to the Social Security Administration on April 13, 1976.

Three major assumptions underlie project methodology:

(1) equal payment for equal service in a given institution, by all payers;

(2) an effective and equitable system based on sound planning, strong certificate of need, licensing and utilization review processes that are coordinated with the budget and rate review functions; and

(3) hospital budgets and rates reviewed within the context of an aggregate statewide expenditure target.

A special Committee, the Project Advisory Committee, was established to monitor the project. This Committee, representing most health care interests in California, has met on a monthly basis reviewing project objectives, methods and direction.

In conducting the project, staff was not to be bound by California Hospital Association (CHA) policy nor was CHA expected to be bound by project results. This arrangement established project staff's relationship to the Project Advisory Committee and was essential in establishing credibility and active cooperation from the Project Advisory Committee. While the Project Advisory Committee operates through general consensus, Committee decisions are not intended to bind the agencies represented in the Committee.

The hospital industry is represented on the Project Advisory Committee through a representative from the CHA Committee on Research and Development. The latter Committee also met on a monthly basis, providing an industry perspective to the project. However, recommendations from this Committee are not binding on project staff. In addition, the Ad hoc Committee on Financial Requirements and Rates, a committee of industry financial specialists, was established to provide the Committee on Research and Development with financial expertise.

It is envisaged that this overall approach will enhance chances of future implementation of the system and of developing a final product acceptable to the myriad of interests in the California health delivery system.

Work described in this report relates to the following areas:

(1) planning criteria (e.g., appropriate size and scope of service, occupancy and estimation of community demand);
(2) methods for identifying and remedying excess capacity;
(3) unit of payment;
(4) inflation indexes;
(5) administrative and legal procedures;
(6) aggregate expenditures forecast;
(7) budget screening procedures;
(8) financial requirements;
(9) uniform accounting and reporting;
(10) quality indicators; and
(11) coordination with licensing.

The unique features of this project center around its emphasis on planning, its use of a statewide expenditures forecast, its use of a lump sum capital cost allowance based on patient care assets and its universality involving all hospital care purchasers. The budget review screens are intended to be automated, focusing on "bottom line" totals, with detailed review by exception.

The attempt to build the system on a sound planning base relates to the thrust of the National Health Planning and Resources Development Act of 1974 (P.L. 93-641). It is assumed that budgets and rates will be reviewed and approved by an independent body that neither purchases nor provides care. If that body does not have direct responsibility for administering the certificate of need program, coordination between the rate setting and certificate of need authority should be provided for in the implementing legislation. Furthermore, the proposed system is directed toward determining rates to be paid by all payers, and all payers would pay their fair share of a hospital's reasonable operating costs.

3. Prospective Incentive Payment Experiment Phase II Proposal

A contract provision called for development of a protocol for a rate-setting experiment (Phase II) based on the methodology developed in Phase I (described in this final report). The protocol, submitted April 13, 1976, proposes a three-year extension with specific application to a budget and rate review experiment in the Sacramento/Sierra Health Service Area. The experiment would involve all 25 nonfederal acute care hospitals

in the region and all payers, including government. Another proposed Phase II component involves further refinements and extensions of the methodology developed in Phase I.

In the proposed experiment, involving two years of rate review, the hospital prospective payment system would be incorporated in a capitation system developed by the Sacramento Medical Care Foundation, under contract with the Social and Rehabilitation Service, HEW, for treatment of Title XIX patients. The hospital prospective rate determination would relate to all patients and be a component of the Title XIX capitation rate. The experiment is to be consistent with PIPE principles.[1]

In general, the rate review methodology proposed for Phase II is consistent with that presented in this Final Report, with some simplifications to enable immediate implementation.

4. Accomplishments for the Reporting Period

This report describes all progress during the PIPE Phase I (April 1, 1975 through June 30, 1976). Not all project components are in the same stages of refinement. This recommended system should be viewed as a model system to be implemented in several stages, beginning with a test limited to a particular region. During the test, lasting two to four years, the system can be expanded and refined prior to statewide

[1]Recent developments have significantly changed the role of the Sacramento Medical Care Foundation in the Title XIX program, changing the nature of the proposed experiment. However, these changes directly affect only the prepayment component, leaving the rate review methodology and scope unchanged.

implementation. The proposed system has extensive data requirements regarding cost accounting, budgeting and case mix indicators. It is essential that efforts be increased to upgrade reporting capabilities of all hospitals so that the system can be implemented in an orderly manner.

4.1 Planning and Excess Capacity

A major project assumption is the need to base budget and rate review on sound planning and certificate of need. While capacity could be controlled strictly through rates, it is likely that such an arrangement will result in a hospital system that is responsive to dollars at the expense of the public interest. A procedure is outlined, but not yet implemented, to forecast community demand for hospital services. The procedure is based on estimation of a demand equation relating demand for hospital services to independent variables relating to:

(1) sociodemographic and economic characteristics of the population at large;

(2) health resources (e.g., physicians, hospital beds, nursing home beds); and

(3) health levels (e.g., morbidity).

The demand function would be estimated on pooled time series-cross section data on county aggregates. Projections would be generated statewide and for each Health Service Area (HSA). These projections could be adjusted by objective criteria relating to "need," if available. Forthcoming data, previously unavailable, on utilization of specific hospital services will greatly enhance the ability to project demand.

Criteria regarding appropriate types of institutions with respect to size and scope of service are necessary to minimize the aggregate costs of meeting community demand for health services. This is a complicated task requiring substantial data and a combination of long-term efforts involving industrial engineering, finance, medicine and economics. Our progress in this area has been largely judgmental beginning with the assumption that the public can best be served from a cost effectiveness standpoint by fewer, relatively large full service hospitals in metropolitan areas.

It is asserted that a hospital in an urban setting should be licensed to provide the following basic services:

(1) Medical;

(2) Surgical; and

(3) Emergency.

Moreover, the hospital should provide, or formally arrange through a shared services network for the provision of, the following supplemental services:

(1) Obstetrics;

(2) Pediatrics; and

(3) Outpatient.

Given these minimal service constraints, the relationship between hospital size and population of service area used in the State Plan for Hospitals and Related Health Facilities, 1972-1974, was adopted. In addition, assuming the daily census is Poisson distributed, a one percent probability of completely filling the facility (four days a year) was adopted to provide approximate occupancy standards.

Using these standards and certain assumptions on the proportion of hospitals' operating costs that are fixed, very approximate estimates were made of the costs of excess bed capacity. These estimates were only made for illustrative purposes in an attempt to tie together the planning and rate review functions. Limitations of the Poisson distribution are enumerated. Directions for future research in this area are also suggested.

An outline was presented suggesting a possible methodology for phasing out existing excess capacity. This involves consideration of factors including: size, location, cost, occupancy, service mix, shared services configurations, role of the hospital, age of the hospital and referral patterns. Both outright closure and bed/service reduction are considered.

A planning process is suggested which coordinates rate review and planning functions. The rate review agency would develop statewide and areawide demand projections which would be input to the state and regional health plans. The resulting plan would provide the basic criteria for determination of existing and future facilities and services needs. Based on these standards, the state and regional planning agencies would determine which services and facilities are now needed and will be needed in the future. The rate review agency, State Planning Agency, and the HSAs, in cooperation with the hospital industry, would develop plans for the orderly phaseout of unneeded programs and orderly introduction of new programs. This would also involve appropriate conversion of existing facilities to alternate uses and recommendations regarding shared services and mergers.

The costs of approved phaseout or conversion plans would be recognized in approved rates. An appropriate phaseout period would be established. Hospitals refusing to adopt the approved phaseout plans will be allowed rates consistent with efficient capacity utilization as determined through a relatively tough budget and rate review process. To facilitate phaseout, rates would be approved that are sufficient to retire existing debt and cover invested capital. Hearings and judicial review would be vital components of this system.

4.2 Budget and Rate Review Methodology

The project envisages a largely computerized budget review process, with detailed (manual) review by exception. Close coordination between rate review, planning and licensing functions is essential. The rate review methodology is based on the following components:

(1) An Aggregate Expenditures Forecast (AEF) which attempts to identify a reasonable total expenditure for hospital services and serves as a target for the sum of the individual hospital budgets. The Aggregate Expenditures Forecast is designed to accommodate major third-party payers, particularly Title XIX, who must budget for their programs well in advance of individual budget and rate review decisions. The Aggregate Expenditures Forecast is also intended to accommodate hospitals through identifying aggregate expenditures by source of payment. This provides a mechanism to relate public and private payments to assure an equitable apportionment among payers in the aggregate.

Moreover, this mechanism would encourage realistic budgeting for government programs. The Aggregate Expenditures Forecast is to be determined through analysis of historical data combined with assumptions regarding use, costs and cost containment in the prospective year. The Aggregate Expenditures Forecast would be adopted through public hearings, enabling testimony from all affected interests (e.g., hospitals, physicians, government, consumers and private third-party payers). Possible methods for generating the Aggregate Expenditures Forecast are presented along with some preliminary forecasts relating to the Sacramento/Sierra HSA, for illustration purposes only. It should be noted the AEF will incorporate a two percent add-on, to be held in reserve for necessary rate adjustments during the prospective year.

(2) A Hospital Input Prospective Price Index (HIPPI), an index reflecting the exogenous component of factor prices, is proposed to enable evaluation of budgets with respect to real changes (e.g., volume, services, programs).
A Laspeyres index is proposed, based on the individual institution's base period input mix, in relating price changes to various components of the Consumer Price Index and the Wholesale Price Index.

(3) A computerized multistage screening procedure incorporating the AEF and HIPPI and concentrating on relatively broad cost components (e.g., cost per discharge, rate of return on assets). The screening centers on the total hospital budget and more detailed parameters become

binding only if the hospital appears costly relative to its peer group.

4.2.1 Budget Review Screening Procedure

The screening system has the following goals:

(1) review each budget to assure that it reflects efficient production of hospital services;

(2) consider aggregate hospital expenditures, statewide;

(3) minimize regulatory costs (i.e., emphasize mechanical screens with detailed review by exeption);

(4) preserve opportunity for substantial managerial discretion by centering the review on the total budget rather than individual line items, and by incorporating a rate of return mechanism for all hospitals; and

(5) consider a wide variety of cost influencing variables and trade-offs among cost components by using a multistage screening process.

The basic principle underlying this process is that early screens are fairly aggregate (i.e., total cost per discharge) and later screens, which are more detailed, tighten for those institutions identified as costly in the earlier screens and conversely loosen for those hospitals passing the earlier screens. Implementation of this screening system requires sound and uniform data on historical costs, budgets and patient mix, a sound hospital grouping system, effective planning, effective utilization review, coordinated licensing and a reasonable hospital expenditures forecast.

The following is an outline of the screening steps:

(1) Facility submits budget.

(2) Desk review for completeness and accuracy.

(3) Keypunch data and machine edit.

(4) Deflate each budget to base year prices using HIPPI.

(5) Screen on volume projections.

(6) Screen on total inpatient costs per discharge, relating peer group median cost to aggregate expenditures forecast.

(7) Cost model screen on cost per discharge, incorporating adjustments for volume, service mix and case mix variation.

(8) Screens on inclusive unit costs, Multiple Rate System (MRS); e.g., per discharge pediatric, including all ancillary costs.

(9) Screens on operating costs in questionable inclusive cost centers.

(10) Capital costs screen.

(11) Detailed review as necessary.

(12) Conditional pass.

(13) Adjust aggregate of budgets at conditionally passed levels to Aggregate Expenditures Forecast less two percent (to be held in reserve for appeals and midyear adjustments).

(14) Approval.

The screening system has been partially computerized in an interactive mode permitting the user to vary all parameters at will.

4.3 Adjustments to the Rate Review Process

Only two types of adjustments are proposed: volume and major unforeseen events. Neither adjustment would be retroactive

but would be applied to the subsequent year's rates (year following prospective year). The volume adjustments would be based on fixed versus variable costs.

In very extraordinary circumstances a midyear adjustment would be possible to cover necessary expenses during the remainder of the budget year. This would be limited to major unforeseen events involving severe financial hardship.

4.4 Financial Requirements

Financial Requirements define the cost elements that are eligible for review. They are divided into two categories: (1) Recognized Expenses (primarily operating costs); and (2) Capital Costs. The proposed system incorporates a rate of return on patient care assets for both investor-owned and nonprofit hospitals. Rate of return would be in lieu of recognized expenses of all economic rents (costs associated with use of an asset) and applied to the book value of all patient care assets.

The following expenses are to be recovered through the Capital Cost mechanism:

(1) interest expense;

(2) finance charges;

(3) interest component of lease payments;

(4) dividend payments;

(5) income and franchise taxes; and

(6) discretionary charity allowances.

4.5 Quality

While an equitable and effective cost control program requires sound quality indicators, development of the latter is clearly beyond the scope of this project. Early in the project, an attempt was made to outline an approach that could have promise; however, preliminary work demonstrated that far more data than were readily available would be required. The proposed method is based on statistical quality control procedures used in industry. Thus, a quality monitoring procedure is not built into this system. Development of such will require further research. At this time, dependence will have to be placed on existing review procedures, with selection of the "best" operational system as the model.

4.6 Incentives

The following incentives are inherent in the proposed system:

(1) Hospitals are encouraged to perform sound planning and budgeting recognizing that future funds will be constrained and must be used in ways to insure the long-run viability of the institution.

(2) There is the prospective rate incentive which encourages hospitals to live within their approved budgets to earn a surplus (or avoid losses). In this system, hospitals would be permitted to retain all savings acquired in a given budget year, provided these savings are not the

result of fraud or increased volume. Likewise, hospitals would have to bear all losses, provided these losses are not the result of prespecified major unforeseen events.

(3) Government and other third-party payers are enabled to budget realistically through the Aggregate Expenditures Forecast mechanism and through the provision of equal payment for equal service. Government budgets will not be permitted to be based strictly on fiscal considerations at the expense of necessary service requirements.

(4) The Rate of Return mechanism encourages hospitals to efficiently allocate their available capital resources and encourages managerial discretion on the part of hospital management.

4.7 Grouping

Due to lack of sufficient data, definitive findings on grouping procedures were not obtained.

Two types of classification systems are recommended: hospitals and inclusive cost centers (Multiple Rate System). For early implementation, it is recommended hospitals be grouped in a three-dimensional classification involving:

(1) Scope of Service;

(2) Metropolitan versus Nonmetropolitan; and

(3) Size.

Scope of Service could follow the categories developed by Berry (1973). These categories could be modified to conform to state licensing classifications.

Grouping on the inclusive cost centers cannot be performed for several years as such data are not currently available.

A sound grouping system is an essential component of the budget and rate screening system proposed here. Development of a sound grouping system requires substantial efforts. The system suggested here is only intended as preliminary, to enable implementation of the system on a test basis, and should be continually tested and refined.

4.8 Due Process

It is intended that due process of law attend both the adoption and the operation of the rate review process. Thus, the rules, regulations and procedures used by the Rate Review Board are to be promulgated in accordance with the Administrative Procedures Act. Additionally, the hospital shall be given an opportunity to challenge the Board's budget and rate determinations, and such challenge shall likewise afford due process. In this regard, the Board shall provide written notice of the areas of disagreement between the Board and the hospital. The hospital may request a public hearing, at which both the hospital and the Board's staff may present evidence and supporting data from such organizations as the Commission for Administrative Services in Hospitals (CASH), Hospital Administrative Services (HAS) and the California Health Data Corporation (CHDC). The Board will consider all evidence and make a determination. If the hospital still finds the Board's decision unacceptable, the hospital may request judicial review of the case. For experimental purposes, de novo judicial review

is proposed; for statewide implementation it may be necessary and proper to limit judicial review to a review of the propriety with which the Board exercised its discretion.

4.9 Sanctions

An effective regulatory program must include the ability of the State to enforce requirements that have been made in compliance with the law, regulations and prudent administrative decisions. Adequate due process, public notice and judicial review, however, are imperative as controls on the regulatory agency. It is proposed that the State shall be authorized to impose sanctions for violations relating to:

(1) budgets and rates; and

(2) certificates of need.

4.10 Licensing

A close coordination between licensing, planning and rate setting is essential. Licensing is addressed in this project through two components.

(1) Scope of Service

As indicated above licenses are required to offer certain basic services. Services in addition to these (e.g., specialty services) must be justified through special permits. Issuance of special permits will be based on criteria involving community need, quality and cost.

(2) Relationship of Standards and Payment

As indicated below, rates for specialty services and services involving expensive technology must be justified by the same special permits identified above. Should a

facility provide a specialty service without a special permit, on a routine basis, only the basic rates will apply (e.g., the basic surgery rate would apply when neurosurgery is performed without a special permit).

4.11 Unit of Payment

A modified inclusive rate structure, Multiple Rate System (MRS), is proposed. The system incorporates components of a la carte charge systems and all-inclusive per diem mechanisms. The Multiple Rate structure has been designed to recognize the different categories of patients and types of hospital services. The detail and number of rates for each hospital represent greater charge distinction reflective of diagnosis and patient service than does the present a la carte system which emphasizes individual services (in particular, ancillary services) charges. The proposed MRS departs from conventional charges for service in the allocation of ancillary units of service (and associated costs) to inpatient groupings. The Multiple Rate System also addresses outpatient categories, however, additional work in this area is desirable. Depending on scope of services offered by a hospital, 20 to 40 inclusive rates could apply to a given hospital.

Because of extensive data requirements, the MRS could not be implemented without several years' lead time. A streamlined a la carte charge system based on standardized units of measure within ancillary departments would be implemented in the short term, enabling review of specific rates as well as total budgets. In the long run the Multiple Rate System would be implemented.

The MRS offers substantial potential from management and regulatory perspectives. First, it provides a streamlined cost-based rate structure tailored to rate comparisons. Second, it relates broad patient type characteristics (e.g., medical/surgical, ICU) to level of care (i.e., specialty services and advanced technology services). Third, it is consistent with State licensing requirements, enabling coordination of rate regulation and licensing regulation. Fourth, it is a valuable unit of service measure for budgeting and control. And fifth, it provides a useful planning tool in terms of costing out major program changes.

4.12 Uniform Budgeting, Accounting and Reporting

The proposed system requires uniform reporting of costs by patient service categories to provide a system of inclusive revenue/cost centers with sufficient flexibility to accommodate hospitals with different patient mixes and volume. The data for budgeting and cost accounting in the proposed system are based on the California Health Facilities Commission Disclosure forms. Since July 1, 1975, acute care hospitals have been reporting their costs to the Commission in a uniform format. In addition to uniform cost data, a uniform statistical breakdown of ancillary service utilization by MRS category is required.

The complete hospital budgeting package for screening consist of:

(1) operating budget;

(2) cash budget;

(3) capital expenditures budget; and

(4) detailed variance analysis (in second and subsequent years of implementation).

The entire budgeting package would be submitted to the Rate Review Board four months prior to the prospective year. The submission would include six months of actual cost data and six months of projected cost data plus the entire budget year.

5. Conclusion

This report presents a proposal for a comprehensive regulatory system for hospitals focusing on aggregate expenditures and the coordination of planning and licensing with budget and rate review functions. The proposed system provides a mix of incentives that does not exist in other current or proposed systems.

This system reflects the general consensus of an advisory committee drawn from major health care delivery interests in California. It combines the attributes of a strong cost containment strategy with fair payment by all payers, payment to hospitals based on their individual budgets, treatment of nonprofit and investor-owned hospitals in a similar manner, a capital cost procedure that encourages hospitals to budget and plan from a cost effectiveness standpoint and a largely computerized screening system enabling review of a large number of budgets with a minimum of staff time.

Given the relatively short project period and the highly ambitious project goals and scope of work, further refinements in the resulting methodology are advised. While this recommendation

is stated throughout the document, it deserves special attention to emphasize the formidable task of developing an effective and equitable cost containment program that is acceptable to the myriad of interests in the health delivery system.

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I. INTRODUCTION

The Prospective Incentive Payment Experiment (PIPE) Phase I was conducted through a 15-month contract (April 1, 1975 through June 30, 1976) for $286,000 from the Social Security Administration (SSA). The project's purpose was to develop necessary criteria, guidelines and methods for a budget and rate review and approval program for hospitals. A related objective was to develop a protocol for implementation of project results through an experiment (Phase II). The protocol was submitted to SSA April 13, 1976. This document covers the progress on this developmental project during its initial phase.

A. Objectives

The primary objective of the project was to develop detailed budget and rate review criteria to be administered by a statewide budget and rate review and approval agency. Budget and rate review criteria are intended to promote individual hospital and industrywide efficiency and productivity advances while providing equity in payment (to payers and providers) and recognizing the relationship between cost, access and quality. A further objective was development of a protocol for implementation of the above criteria through a live experiment in a second phase (July, 1976 through June, 1979).

B. Need For Proposed System

The rapidly increasing cost of health care is a matter of heightened public concern and specific alarm on the part of

government, which now accounts for 40 percent of total health expenditures and 50 percent of hospital expenditures. This has generated governmental efforts, at the federal and state levels, to contain their program costs. Rather than encouraging more efficient delivery of services and therefore cost savings to the general public, these efforts have been largely inconsistent, resulting in cost shifts from government to private health care consumers. This imbalance between government and private payments is worsening and appears to provide no incentives to hospitals to contain their costs.

Many factors account for the rapid increase in health expenditures over the past decade--expenditures increasing from $38.9 billion in 1965 to $118.5 billion in 1975 (205 percent). These include establishment of Titles XVIII and XIX, technological advances, rising expectations and increasing demand in general. This increasing demand must be considered in light of the present health delivery system, characterized by cost-based reimbursement to hospitals, inadequate incentives for prevention (in terms of lifestyles as well as preventive medical care), and divergence of cost containment goals between the hospital administration and the medical staff. Infusion of more and more governmental funds into this apparent abyss has led to increasing efforts by public policymakers to control health care costs, or at least to shift some of these costs to nongovernmental payers. In the long run, the latter effort cannot result in effective and efficient health care delivery in the best interests of society.

Resources devoted to health are diverted from other (equally worthy) uses. The clear public interest attributes of health care and the increasing share of public expenditures on health care mandate the need for sound and consistent regulation of this industry. Unique characteristics of the health sector (e.g., substantial third-party coverage, consumers' lack of information, large nonprofit and philanthropic activity) serve to render the free market mechanism inoperable without drastic changes in our institutions. When pending national health insurance and concomitant infusion of public funds are viewed in light of difficulties in the general economy expected to last through the 1970s, judicious use of health resources becomes imperative. Two recent federal laws, P.L. 92-603 (Social Security Amendments of 1972) and P.L. 93-641 (The National Health Planning and Resources Development Act of 1974), both apparently in anticipation of national health insurance, are the most comprehensive and ambitious attempts to date at gaining control over public funds allocated to health care.

The obvious need is for a comprehensive, coordinated regulatory system implemented in a phased manner, beginning with regional experiments. Such a system will benefit the general public in addition to government, which pays for certain patients from tax funds. By necessity, this system must deal with redundancy of hospital facilities and services and provide powerful incentives for efficient delivery of health care, both within the single institution and industrywide. With regard to the latter, hospital expenditures should be evaluated on

a communitywide basis to determine the reasonableness of aggregate expenditures in a community, and efficient allocation of these expenditures among hospitals.

The system recommended in this report considers the following:

(1) cost containment for the entire industry;

(2) financial viability for the industry;

(3) equity among purchasers of hospital services; and

(4) integration of budget and rate review with other, complementary, regulatory activities.

Critical to the approach recommended here is the concept that consumer expectations are infinite and resources are clearly finite. This requires the ability of a regulatory agency to evaluate aggregate expenditures for the prospective year prior to reviewing and approving individual budget proposals. This mechanism is also essential from the point of view of government programs, which must budget well in advance of the budget period. The health industry places a high priority on equity in payment among purchasers and on predictability. Similarly, government authorities place high priority on predictability and control. The concept of a statewide aggregate expenditures forecast accommodates both these needs.

Another essential component of our recommended system is a strong planning and certificate of need program, consistent with the economic objectives discussed above. Sole reliance on rate-setting functions, given the peculiar characteristics of the

medical care market, is likely to result in a distribution of services and facilities that is not sensitive to the public interest and evolves through a form of "Economic Darwinism."

In summary; steadily tightening economic constraints on the health system are obvious as is the need for a comprehensive and coordinated regulatory program that recognizes these economic constraints in the public interest. The system recommended here is designed to explicitly address these needs.

C. General Description

1. Background

This project is the result of two years of extensive negotiations with Social Security Administration representatives. The original intent was to undertake a prospective payment experiment involving payment to a sample of hospitals. Budgets and rates were to be approved by the California Health Facilities Commission; all payers (Titles XVIII and XIX, Blue Cross, commercial insurance and other payers) were to pay Commission-approved rates.[1] However, Social Security Administration officials required development of clear ground rules for budget and rate review before committing Medicare funds. Thus, this one-year developmental contract was awarded instead of the original proposal. A provision in the developmental contract called for development of a proposal for an experiment, which was

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[1]During the negotiation period a special CHA Task Force developed a report; Effective Health Facility Regulation for California, Sacramento: The Association, May, 1974; conceptualizing the structure of a statewide health facilities regulatory program.

submitted to the Social Security Administration on April 13, 1976.

2. Overall Strategy

2.1. Assumptions

Three major assumptions underlie project methodology: (1) equal payment for equal service in a given institution, by all payers; (2) an effective and equitable system based on sound planning, strong certificate of need, licensing and utilization review processes that are coordinated with the budget and rate review functions; and (3) hospital budgets and rates reviewed within the context of an aggregate, statewide hospital expenditure target.

2.2. Role of Committees and Staff

A special committee, Project Advisory Committee (PAC), was established to monitor the project. This Committee represents most health care interests in California. A list of Committee members is presented in Appendix A. The Committee has met on a monthly basis, reviewing project objectives, methods and direction. The Committee members concerned themselves with presenting their particular interests, these interests were discussed, and direction was then provided staff through general consensus of the Committee. However, the Committee members did not bind their organizations to project concepts. Each interest represented has reserved the right to disagree in whole or in part with the conclusions of the project.

In conducting the project, staff was not to be bound by California Hospital Association (CHA) policy. Nor was CHA expected to be bound by project results. This was a clear understanding among all concerned parties, including the CHA Board of Trustees, from the beginning of the project period. This arrangement established project staff's relationship to the Project Advisory Committee and was essential to establish credibility with and active cooperation from the PAC.

The hospital industry, through the CHA Committee on Research and Development (CRD), has been represented on the PAC. The Committee on Research and Development has also met on a monthly basis, providing its representative to the PAC with necessary direction. In December, 1975, the Committee on Research and Development appointed a technical subcommittee to concentrate on financial components--Ad hoc Committee on Financial Requirements and Rates. This Committee of industry financial experts which provided technical guidance to CRD met four times. It is important to note the Hospital industry's only input to the project from a policy perspective was through its representatives to PAC. Lists of the CRD and the Ad hoc Committee members are also presented in Appendix A.

It is envisaged that this overall approach will enhance chances of future implementation of the system and of developing a final product acceptable to the myriad of interests in the California (and the entire United States) health system.

2.3. Methodology

To a large extent, the basic research design, at the beginning of the project, drew heavily from previous experience in conducting the Hospital Effectiveness Demonstration Project (HEDP), funded by the National Center for Health Services Research and Development. The HEDP had the objective of developing a prototype statewide hospital reporting system enabling fair comparison of diverse institutions. Through the HEDP considerable attention was given to: (1) uniform financial reporting and accounting; (2) uniform budgets; (3) alternative methods of grouping hospitals to compare departmental and balance sheet data; and (4) estimation of cost functions controlling for service mix and case mix variation.[2] This provided a useful base for project activities dealing with uniform reporting and budgeting and evaluation of hospital costs.

During the past year, the Principal Investigator and Project Director participated in deliberations of the Task Force on Short- and Long-Run Objectives of the California Health Facilities Commission, which resulted in a Commission recommendation for a budget and rate review system.[3] Through

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[2]For additional information on this project see: Hospital Effectiveness Demonstration Project, Final Report, 1974; H. W. Zaretsky, Development of a Financial Reporting System for Hospitals as a Basis for Regulation, 1974; and H. W. Zaretsky, Analysis of Hospital Costs Controlling for Service Mix and Case Mix Variation, 1974.

[3]"A Proposed Budget and Rate Review System for California Hospitals," January, 1976 (Processed). William L. Dowling was the consultant employed to coordinate and prepare the report.

these meetings, many ideas were generated which significantly contributed to the system set forth in this Final Report.

Work described in this report relates to the following areas:

(1) planning criteria (e.g., appropriate size and scope of service, occupancy and estimation of community demand);
(2) methods for identifying and remedying excess capacity;
(3) unit of payment;
(4) inflation indexes;
(5) administrative and legal procedures;
(6) aggregate expenditures forecast;
(7) budget screening procedure;
(8) financial requirements;
(9) uniform accounting, budgeting and reporting;
(10) quality indicators;
(11) coordination with licensing;
(12) adjustments;
(13) grouping; and
(14) sanctions.

The unique features of this project center around its emphasis on planning, its use of a statewide expenditures forecast, its use of a lump sum capital costs allowance based on patient care assets and its universality involving all hospital care purchasers. The budget review screens are intended to be automated, focusing on "bottom line" totals, with detailed review by exception. The attempt to build the system on a sound planning base relates to the thrust of the National Health Planning and Resources Development Act of 1974 (P.L. 93-641).

It is assumed that budgets and rates will be reviewed and approved by an independent body that neither purchases nor provides care. If that body does not have direct responsibility for administering the certificate of need program, coordination between the rate-setting and certificate of need authorities must be provided for in the implementing legislation. Furthermore, the proposed system is directed toward determining rates to be paid by all payers, and all payers would pay their fair share of a hospital's approved budget reflecting reasonable operating costs.

2.4 Phase II Proposal

A contract provision called for development of a protocol for a rate-setting experiment (Phase II), based on the methodology developed in Phase I (first year). The protocol submitted April 13, 1976, proposed a three-year extension (July 1, 1976 through June 30, 1979), with specific application to a budget and rate review experiment in the Sacramento/Sierra Health Service Area.[4] The experiment would involve all 25 nonfederal, acute care hospitals in the region and all payers, including government. Another proposed project component involves further refinements and extensions of the methodology developed in Phase I (e.g., further development of rate review and planning methodologies).

In the proposed experiment, involving two years of rate review, the hospital prospective payment system would be

[4]Area 02 HSA is composed of Sacramento, Sierra, Yolo, Yuba, Sutter, Nevada, Placer and El Dorado counties.

incorporated in a capitation system developed by the Sacramento Medical Care Foundation, under contract with the Social and Rehabilitation Service, HEW, for treatment of Title XIX patients. The hospital prospective rate determination would relate to all patients and be a component of the Title XIX capitation rate. The experiment is to be consistent with PIPE principles:[5]

(1) equal payment for equal service;

(2) coordination with planning and licensing;

(3) tight budget and rate review, within a total hospital expenditures target for the area;

(4) detailed exception review; and

(5) due process (i.e., hearings and judicial review).

In general, the rate review methodology proposed for Phase II is consistent with that presented in this final report, with some simplifications to enable immediate implementation. (Approved budgets and rates would be effective January 1, 1977.)

II. ACCOMPLISHMENTS FOR THE REPORTING PERIOD

This section describes all progress during the PIPE Phase I (April 1, 1975 through June 30, 1976). Not all project components are in the same stages of refinement. This recommended system should be viewed as a model system to be implemented in several stages, beginning with a test limited to a particular region. During the test, lasting two to three years,

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[5]Recent developments subsequent to submission of the proposal have significantly altered the PIPE interaction with prepayment. The experiment proposed for Phase II should now be considered as divorced from Title XIX prepayment. The prepayment project will not take place in the Sacramento/Sierra area. However, the experiment would still include all payers.

the system can be expanded and refined prior to statewide implementation. The proposed system has extensive data requirements regarding cost accounting, budgeting and case mix indicators. It is essential that efforts be increased as soon as possible to upgrade reporting capabilities of all hospitals so that the system can be implemented in an orderly manner.

A. Planning and Excess Capacity

A major project assumption is the need to base budget and rate review on sound planning and certificate of need. While capacity could be controlled strictly through rates, it is likely that such an arrangement will result in a hospital system that is responsive to dollars at the expense of the public interest. Thus, if approved rates are keyed to target occupancy levels, the hospital will be encouraged to increase volume, cut corners and/or increase productivity. Relatively sophisticated external quality and utilization controls would be necessary in such a case. In the end the system would still depend on nonmarket decisions, in the latter case relating to quality (including appropriate utilization); while in the case proposed by this project, nonmarket decisions relate to planning. While the state-of-the-art in either field leaves much to be desired, measurement of quality is the least advanced. In the most obvious example, relegating planning functions to the market mechanism could result in shifting of relatively complex case mixes to public hospitals or to hospitals with a substantial charity base.

1. Forecasting Community Demand

The procedure outlined here has not yet been tested due to previous lack of data, which are now becoming available through the Hospital Disclosure Act. The following procedure is suggested to develop long- and short-term forecasts of hospital utilization. A standard demand equation is specified relating the particular dependent variable (admissions, patient days, length of stay) to independent variables relating to: (1) sociodemographic and economic characteristics of the population at large; (2) health resources (e.g., physicians, hospital beds, nursing home beds); and (3) health levels (e.g., morbidity).[6] The demand function would be estimated on pooled time series-cross section data on county aggregates. Projections would be generated statewide and for each Health Service Area.[7]

Table 1 lists dependent and independent variables and sources of data.

The model would be estimated through linear regression. Prior to model specification and estimation, factor analysis would be used in an attempt to consolidate the variables relating to incidence of acute conditions (consistent data on chronic conditions are not available).[8] A notable independent variable not included in Table 1 is insurance coverage, which is not available below the state level.

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[6]See Feldstein (1971), Davis and Russell (1972) and van der Gaag et al (1975) for similar approaches.

[7]These projections could be adjusted by objective criteria relating to "need," if available.

[8]It also would be useful to test for interaction between demographic and morbidity variables.

TABLE 1
SUGGESTED VARIABLES TO BE USED
TO ESTIMATE HOSPITAL SERVICES DEMAND MODEL
AND SOURCES OF DATA*

VARIABLE	SOURCE
DEPENDENT	
Admissions/1000 Population	American Hospital Association Annual Survey
Length of Stay	American Hospital Association Annual Survey
Outpatient Visits/1000 Population	American Hospital Association Annual Survey
INDEPENDENT	
Cost Per Inpatient Day	American Hospital Association Annual Survey
Cost Per Outpatient Visit	American Hospital Association Annual Survey
Hospital Beds/1000 Population	Department of Health
Nursing Home Beds/Hospital Beds	Department of Health
County Hospital Beds/Total Hospital Beds	Department of Health
Physicians/1000 Population	American Medical Association Distribution of Physicians
Percent Surgeons	American Medical Association Distribution of Physicians
Title XIX Recipients/1000 Pop.	Department of Health
Welfare Recipients/1000 Pop.	Department of Benefit Payments
Labor Force Participation Rate	Employment Development Dept.
Unemployment Rate	Employment Development Dept.
Per Capita Income	Department of Finance
Age Distribution	Department of Finance
Household Size	Department of Finance
Incidence of Acute Conditions	Department of Health
Mortality Rates	Department of Health
Trend Factor	---------

*Data to be in the form of county (or HSA) aggregates for five years.

While this approach yields only aggregate estimates of hospital use, estimates too aggregate for planning decisions regarding particular services or spatial considerations, fairly comprehensive data on use of particular services will shortly be available through two sources: (1) Disclosure (November, 1976); and (2) a CHA utilization survey (input form is Figure 1). The latter was initiated in April, 1976 on a monthly basis covering all hospitals in California.

Current utilization information from these sources could be used to establish cross-sectional relationships between the aggregate statistics (admissions, patient days and outpatient visits) and more specific variables (e.g., ICU, Medical/Surgical, various ancillary services). Thus, given projections of the aggregate variables projections of specific services demand could be obtained. (It should be noted that demographic characteristics of each region could be incorporated in determining relationships between aggregate and more specific utilization variables.) While the proposed method is not sophisticated, it can produce valuable inferences.

2. Model Hospital: Minimum Size and Scope of Service

Criteria regarding appropriate types of institutions with respect to size and scope of service are necessary to minimize the aggregate costs of meeting community demand for health services. This is a complicated task requiring substantial data and a combination of long-term efforts involving industrial engineering, finance, medicine and economics. Our progress in this area has been largely judgmental, beginning with the assumption that the public can best be served from a cost-

HOSPITAL UTILIZATION REPORT FOR THE MONTH OF _____ 19__ SIDE 1

Hospital _____ Address _____

Prepared by _____ Telephone _____

INPATIENT SERVICE	LN NO	LICENSED BEDS (1)	AVAILABLE BEDS (2)	STAFFED BEDS (3)	SERVICE DISCHARGES (4)	TOTAL PAT. DAYS (5)
Medical/Surgical	01					
Pediatrics	02					
Perinatal (Obst.)	03					
Psychiatric	04					
Rehabilitation	05					
SNF	06					
ICU/CCU	07					
Other	08					
TOTAL	09				XXXXXXXXXXXX	

SELECTED ANCILLARY SERVICES	LN NO	INPATIENT (7)	OUTPATIENT (7)
Labor & Delivery	14		XXXXXXXXXX
*Surgery & Recovery	15		
**Labs: Clinical	16		
**Labs: Pathology	17		
Electrocardiology	18		
Radiology - Diagn.	19		
Inhalation Therapy	20		
Physical Therapy	21		
Emergency	22		
Psychiatric E.R.	23		

SOURCE OF PAY	LN NO	TOT. DISCHRGS.(6)	TOTAL PAT. DAYS (5)
Medicare	10		
Medi-Cal	11		
Other	12		
Total	13		

* Include Surgical Day Care in Outpatient Surgery & Recovery.
**Do not include calibration or quality control tests.

-SEE OTHER SIDE FOR DEFINITIONS-

(OPTIONAL)

OTHER ANCILLARY SERVICES	LN NO	INPATIENT (7)	OUTPATIENT (7)
Labs: Pulmonary	24		
Labs: Other	25		
Blood Bank	26		
Electromyography	27		
Electroencelography	28		
Radiology - Therapy	29		
Nuclear Medicine	30		
Dialysis	31		
Occupational Therapy	32		
Clinics	33		
Other	34		

Any inquiries regarding this report should be addressed to:

SURVEY RESEARCH
California Hospital Association
925 "L" Street, Suite 1250
Sacramento, California 95814
(916) 443-7401, Extension 18

FIGURE 1 (cont.)

DEFINITIONS

1. Number of beds as stated on the facility license.
2. Include all beds existing at the end of the month except those in nursing units which are physically obsolete or have been converted to other use than inpatient overnight accommodations.
3. Beds fully staffed at census taking on the last day of the month, regardless of occupancy.
4. Discharges from service for the month, excluding newborns (including patients transferred from one service to another).
5. Census patient days for month, excluding newborns.
6. Discharges from hospital for the month, excluding newborns.
7. In units of service as defined in California Hospital Accounting Manual.

effectiveness standpoint by fewer, relatively large, full-service hospitals in metropolitan areas. This is not to suggest that all urban hospitals should be tertiary care centers. However, there is consensus in the Project Advisory Committee that a hospital in an urban setting should be licensed to provide the following basic services:

(1) Medical;

(2) Surgical; and

(3) Emergency.

Moreover, the hospital should provide, or formally arrange through a shared services network for the provision of, the following supplemental services:

(1) Obstetrics;

(2) Pediatrics; and

(3) Outpatient.

Given these minimal service constraints, the relationship between hospital size and population of service area used in the State Plan for Hospitals and Related Health Facilities, 1972-1974 was adopted. In addition, assuming the daily census is Poisson distributed, a one percent probability of completely filling the facility (four days a year) was applied to develop approximate occupancy standards (see Table 2):

TABLE 2

POPULATION OF SERVICE AREA	MIN. SIZE FACILITY	OCCUPANCY*
Less than 25,000	one facility	65%
25,000 - 49,999	50 beds	70%
50,000 - 74,999	75 beds	75%
75,000 - 99,999	100 beds	80%
100,000 - 124,999	125 beds	80%
125,000 - 199,999	150 beds	80%
200,000 - 499,999	200 beds	85%
500,000 and over	300 beds	85%

*Assuming a Poisson distribution, these occupancies are consistent with a given facility being completely filled about four days a year.

Use of the Poisson distribution to explain daily census fluctuations is obviously questionable, given: (1) some hospitals have Distinctive Patient Facilities (DPFs); i.e., certain types of patients can stay only in certain types of facilities (e.g., obstetrics, pediatrics, ICU); and (2) a substantial amount of admissions can be scheduled. The latter implies Poisson predictions could be exceeded without increasing the "overfill rate." However, given that there are DPFs, we are dealing with smaller facilities than the total bed size of a hospital suggests. The Poisson distribution is applicable only if the entire caseload is emergency (random) and the bed complement is sufficiently large to almost never turn away any demand. Recent research has provided more appropriate tools; see for example Shonick (1972). However, full utilization of these tools requires

data on numbers and sizes of DPFs and proportions of elective and emergency cases in each DPF, data not currently available (and beyond the scope of this one-year project). Criteria suggested by Shonick are straightforward and could readily be applied given DPF data, which will be available shortly. Shonick's results suggest the Poisson occupancy criteria are somewhat low. A DPF of 35 beds should have an average occupancy of 71 percent while one of 225 beds should be 89 percent full, on the average.

In any event, the rough criteria presented here provide a starting point to formulate approaches to dealing with the current excess capacity problem as it is related to a consistent cost containment strategy.

Size and service scope criteria presented above are based on the observations that:

(1) The existence of distinctive patient facilities creates constraints on the average daily census that can be accommodated by a given hospital without an unacceptable overfill rate.

(2) This problem is substantially moderated if the distinctive patient facilities are relatively large.

(3) Hospitals, other than tertiary care centers, should have few DPFs (i.e., medical/surgical, pediatrics, obstetrics), to minimize potential for bottlenecks justifying low average occupancy rates. This type of configuration would require coordination of services among institutions in a given service area.

It should be emphasized that the rough size criteria referred to above have to be related to distinctive patient facilities rather than entire hospitals and some accommodation has to be made for hospitals which are a major component of a shared services arrangement (involving medical services).

In-depth studies could provide further criteria regarding economically efficient service scope. For example, the Phase II Proposal suggests four areas of inquiry:

(1) The effects of volume and size on efficiency could be evaluated through comparisons of unit costs for specific services among groups of hospitals; grouped according to size, scope of service and location (three-dimensional). Two-way analysis of variance or appropriate nonparametric tests (e.g., Kruskal-Wallis) would be employed. By November, 1976, data at the departmental level will be available, through Disclosure, on all hospitals in California.

(2) The same procedure could be used to compare costs per discharge among Multiple Rate System (MRS) categories.[9] Data would be based on a sample of hospitals. Moreover, using this sample, controls could be added for diagnostic (ICDA) mix through use of factor analysis or clustering

[9]Section L below describes the proposed Multiple Rate System, which is a modified inclusive rate structure intended for interhospital comparisons.

techniques. This task would yield information on what factors contribute to efficiency in treating particular types of patients.

(3) Using data from a sample of hospitals, break-even analyses could be performed for various services and MRS categories. This would provide a check on the ability to generalize inferences drawn through (1) and (2) above.

(4) Disclosure data will permit evaluation of market shares for specific services among all hospitals in a region. Based on findings regarding appropriate capacity and volume, market shares would be "redistributed" among hospitals to simulate cost savings obtainable through sound planning. In addition, the existing distribution of services and volume among institutions could be evaluated with regard to demand projections.

3. Excess Capacity

3.1 Description

Based on licensed bed capacity, the average occupancy in California is currently below 60 percent.[10] While precise estimates of the cost impact of this excess capacity are not available, it is obvious that excess capital and duplication of services is costly. Rough estimates of this cost impact were obtained through use of the size and occupancy criteria described above and through the assumption that

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[10]To the extent that licensed beds are not staffed, or licensed bed capacity is used for other purposes, use of this base in calculating occupancy rates overstates the problem. However, at this time, licensed capacity is the most objective estimate available of "real" capacity.

60 percent of an average hospital's annual costs are fixed. (The latter was suggested from empirical results from the Hospital Effectiveness Demonstration Project.[11] This involved "closing" hospitals based on size and assuming their fixed costs were then saved. This needs considerable refinement, considering a multitude of factors (e.g., location, costs, occupancy, service mix, age of facility, travel time, shared services, referral patterns).

Calculations are summarized in Table 3. The method is described below, and a detailed area-by-area summary of the calculations is presented in Appendix B.

(1) Step 1

Data were extracted from the California State Plan for Hospitals and Related Health Facilities, 1972-1974, and from The 1973 American Hospital Association Guide to the Health Care Field. The period involved is 1972. Hospitals within an area were ordered by licensed bed size, then data were totaled for each of the following categories:

licensed beds	occupancy (licensed)
available beds	occupancy (available)
patient days	total costs
admissions	

(2) Step 2

Small hospitals were hypothetically closed until occupancy neared that desired for the area. Desired occupancy was keyed to service area population previously described (see Table 2 above).

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[11] H. W. Zaretsky, Analysis of Hospital Costs Controlling for Service Mix and Case Mix Variations, Sacramento: The Association, 1974.

Table 3

SUMMARY - EFFECTS OF INCREASING OCCUPANCY
IN CALIFORNIA -- 1972

	Step 1	Step 2	Step 3
Number of Hospitals	554	312	312
Number of Beds	76,059	59,241	55,322
Patient Days	16,855,009	16,855,009	16,855,009
Occupancy	61%	78%	83%
Total Costs ($ in 000)	2,702,556	2,388,518	2,350,502
Percent Savings	--	12%	13%

Step 1 - Actual Data, 1972
Step 2 - Effects of Hypothetically Closing Hospitals
Step 3 - Combined Effects of Closing Hospitals and Reducing Beds in Remaining Hospitals

The patient days attributable to the closed hospitals were spread among the remaining hospitals, with no increase in beds in those remaining hospitals. To determine the impact upon cost, several assumptions were made: (a) the fixed costs of the closed hospitals would be eliminated; (b) the variable costs of the closed hospitals were attributed to the total costs of the remaining hospitals; and (c) fixed and variable costs were somewhat arbitrarily assigned at 60 percent and 40 percent respectively.

(3) Step 3

Having arrived at an adjusted cost figure as a result of "closing" hospitals, a finding of the HED Project was next applied. There it was estimated that for every ten percentage point increase in occupancy, a hospital would realize a $30 savings per admission. Thus, it was next calculated how many beds would need to be yet eliminated to increase overall occupancy to the desired level, and obtained a final cost figure by applying the $30/ten percentage point change to the change in occupancy between Steps 2 and 3.

3.2 Results

As shown in Table 3, a statewide "savings" of $352,054,000--approximately $423,062,000 in 1974 dollars--was the result of increasing overall occupancy to 83 percent.

3.3 Discussion

(1) Fixed Costs, Semi-Variable Costs, Variable Costs

As presented here, the increased occupancy savings were based upon an assumption of 60 percent fixed costs,

40 percent variable costs. It is recognized, however, that these fixed-cost savings may be over- or understated due to the simplistic breakdown of costs and would vary considerably across facilities. When Disclosure data become available, it will be possible to identify costs which are fixed (those costs which do not vary with respect to levels of output over a specific time period and volume range), variable (those costs which vary with volume), and semi-variable (costs which exhibit a combination of fixed and variable behavior). It will then be possible to more accurately calculate anticipated savings from capacity reduction.

(2) Outpatient Costs

Currently only total hospital costs have been calculated, without breaking out those costs according to inpatient care and outpatient care. This distorts the estimates. This can also be remedied through use of soon to be available Disclosure data.

(3) Service Area Characteristics

It is recognized that the strict approach of closing hospitals according to bed size is overly arbitrary and unfair. Particularly important are such factors as travel time to remaining facilities, service characteristics of remaining facilities, whether the facility is an inner city facility, referral patterns, sociological characteristics of the affected hospital's clientele, and so on.

A hospital-by-hospital analysis of these factors was not undertaken due to lack of sufficient data and resources; however, Section 3.4 below presents an initial attempt at developing a decision methodology which considers these and other factors.

(4) Conversion/Alternative Use of Facilities

Hospital facilities may be especially adaptable to a number of uses once the decision has been made that its use as an acute care inpatient facility is inappropriate. Among such alternatives might be:

- Outpatient Clinic
- Convalescent Facility
- Residential Care Facility
- Senior Citizens Facility
- Medical Offices
- Nonhealth-Related Uses (Business Offices, Hotel/Motel, etc.)

Where an appropriate alternative use of a facility also corresponds with community needs for health-oriented facilities, there might be additional justification for use of closure-related savings to finance the conversion.

(5) Case/Service Mix

Case mix and service mix have not yet been addressed in the decision flowchart presented in Section 3.4. The Hospital Effectiveness Demonstration Project developed some background for considering the effect of these factors on hospital performance. These are relevant not only to the

projection of demand on the macro level, but also to the evaluation of existing facilities in the context of closure/reduction. Considerable additional work in this area is called for.

(6) Time Phasing

How much time should be allowed for an area to reach target utilization levels? How long can the system absorb below standard size/service/occupancy levels in anticipation of future needs? This is a difficult area and we have not yet arrived at a satisfactory approach.

(7) Sanctions

Once a decision is made by the appropriate planning agency, how is it implemented? This may be the most sensitive question addressed in the project. The approach recommended here (and elaborated in Section 3.4 below) involves:

- Health Systems Agency (HSA) to identify excess capacity.
- HSA, rate review agency and affected hospital to develop three- to five-year phase out plan.
- Cost of approved plans to be recognized in approved rates (to cover debt and invested capital).

The alternative to direct reduction of excess capacity is indirect reduction (i.e., through the rate-setting mechanism). Here the rate-setting authority would establish rates based on target occupancies (e.g., per diem rates at 85 percent occupancy), with the intent of forcing the low occupancy institutions out of business. This is the easiest approach for the major payers,

but from consumer and provider perspectives is the least equitable, and would undoubtedly lead to deterioration of the financial viability of the entire industry and a serious erosion of quality of care. A major premise in the project is the consideration of total industry effectiveness.

In summary, the project proposes a method to reduce current excess capacity and avoid future excess capacity through direct means involving:

(1) Compensating owners for closing down current excess capacity--facilities and services.

(2) Requiring certificate of need for expansion, modernization and replacement.

(3) Under certain limited circumstances, using the rate-setting mechanism for reducing capacity; for example, where necessary reductions involve only parts of institutions.

These procedures must involve due process.

Naturally, it is hoped most of these changes can be effected through a combination of regulation and voluntary actions. For example, given the use of an aggregate expenditures target combined with emphasis on negotiation of phaseout plans, it is likely local hospitals will develop plans among themselves for coordination of programs.

3.4 Facility Closure: Outline of an Approach

This section presents some concepts relating to elimination of current excess capacity. This is only a skeletal framework of how the planning and rate review mechanisms can be coordinated to address excess capacity.

(1) Evaluate Current Conditions

This involves a comparison of the present situation in light of the future. When will the present disequilibrium be absorbed by population growth? Can the hospital economy survive this long a period of disequilibrium? This type of evaluation must be conducted at statewide and areawide levels.

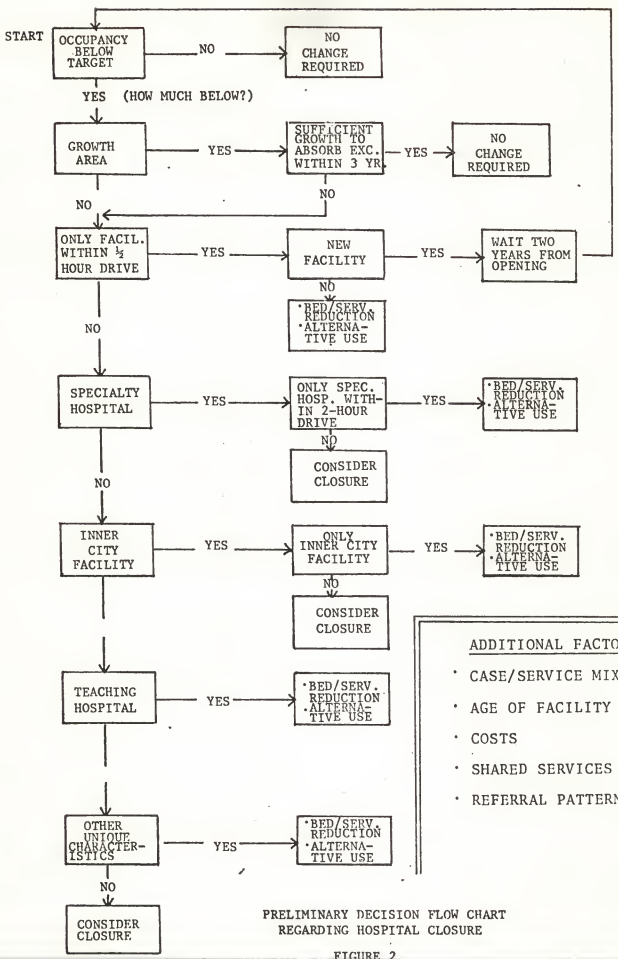
(2) Hospital-By-Hospital Evaluation

Once a decision has been made that the hospital composition within an area is inappropriate, how does one go about changing it? Figure 2 presents an initial attempt at outlining the decision process.

A hospital-by-hospital evaluation is recommended, which will result in a hospital being categorized as either: (a) eligible for closure; (b) eligible for bed/service reduction, or alternative use of certain areas within the hospital (conversion to outpatient clinics or medical offices, for example); or (c) no change required. Having been so categorized, a new set of analyses would be undertaken to ascertain which facilities of those eligible shall be affected.

For "Consider Closure" eligibles, relevant factors include:

- Size
- Location
- Costs



PRELIMINARY DECISION FLOW CHART
REGARDING HOSPITAL CLOSURE

FIGURE 2

- Occupancy
- Service mix
- Part of a network of shared services
- Government facility
- Age of facility
- Referral patterns

For "Bed/Service Reduction--Alternative Use" eligibles, relevant factors include:

- Current occupancy
- Occupancy by service
- Costs
- Feasibility of merger or shared services
- Complementarity of existing services

Application of this process would require a methodology to weight the above "relevant factors."

4. Process

This section outlines a proposed process to coordinate the budget review and planning functions.

(1) The Rate Review Board would establish a formal relationship with the State Health Planning Agency to assist in coordination of their programs. Both agencies would share available data.

(2) The Rate Review Board will develop statewide and areawide demand projections (inpatient days, admissions, and outpatient visits) and will input these projections to the State Health Plan. The final plan (after inclusion of economic projections) will provide the basic criteria for

determination of existing and future facilities and services needs.

(3) Based on these economic standards, the State Planning Agency and HSAs will determine which services and facilities are now needed and which will be needed in the future.

(4) The Rate Review Board, the State Planning Agency and the HSAs, in cooperation with the hospital industry, will develop plans for the orderly phaseout of unneeded programs and orderly introduction of new programs. This will also involve appropriate conversion of existing facilities to alternate uses and recommendations regarding shared services and mergers.

(5) The costs of approved phaseout and/or conversion plans will be recognized in approved rates. An appropriate time interval will be established.

(6) Hospitals refusing to adopt the approved phaseout plans will be allowed rates consistent with efficient capacity utilization as determined through a relatively rigorous budget and rate review process. That is, occupancy targets would be employed for these facilities.

(7) To facilitate phaseout, rates would be approved that are sufficient to retire existing debt and cover invested capital. Again, this would take place over the life of the plan (e.g., three to five years).

(8) Hearings and judicial review will be vital components of this system.

B. Budget and Rate Review Methodology

1. Description of Overall Process

The project envisages a largely computerized budget review process, with detailed (manual) review by exception. Close coordination between rate review, planning and licensing functions is essential. The rate review methodology is based on the following components:

(1) Aggregate Expenditures Forecast (AEF), which attempts to identify a reasonable total expenditure for hospital expenditures and which serves as a target for the sum of the individual hospital budgets. The Aggregate Expenditures Forecast is designed to accommodate major third-party payers, particularly Title XIX, who must budget for their programs well in advance of individual budget and rate review decisions. The Aggregate Expenditures Forecast is also intended to accommodate hospitals through identifying aggregate expenditures by source of payment. This provides a mechanism to relate public and private payments to assure an equitable apportionment among payers in the aggregate.

The Aggregate Expenditures Forecast is to be determined through analysis of historical data combined with assumptions regarding use, costs and cost containment in the prospective year. The Aggregate Expenditures Forecast would be adopted through public hearings, permitting testimony from all affected interests (e.g., hospitals, physicians, government, consumers, private third-party payers).

(2) A Hospital Input Prospective Price Index (HIPPI), an index reflecting the exogenous component of factor prices, is proposed to enable evaluation of budgets with respect to real changes (e.g., volume, services, programs). A Laspeyres index is proposed based on the individual institution's base period input mix, and relating price changes to various components of the Consumer Price Index and Wholesale Price Index.

(3) A computerized, multistage screening procedure, incorporating the AEF and HIPPI, and concentrating on relatively broad cost components (e.g., cost per discharge, rate of return on assets). The screening centers on the total hospital budget and more detailed parameters become binding only if the hospital appears costly relative to its peer group.

2. Aggregate Expenditures Forecast: The Foundation of the Budget Review Process

For a budget and rate review system to achieve significant cost containment and at the same time promote realistic budgeting for government programs, it is essential that the system address the aggregate magnitude of hospital expenditures (both statewide and for smaller regions; e.g., HSAs). Obviously, what is crucial for major third-party payers is not what they pay to individual hospitals per se, but that the aggregate total is reasonable in terms of value and service.

In forecasting aggregate expenditures, based on historical data, the budget review authority would take the following into account:

(1) volume and type of health services;

(2) economic and sociodemographic factors;

(3) morbidity patterns;

(4) health system characteristics;

(5) cost containment objectives for the prospective year.

Total projected expenditures would be apportioned by payment category, based on past utilization patterns and caseload projections, and could be further disaggregated into Health Service Areas (HSAs).

The health industry places high priority on each payer paying its "fair share" (i.e., no price discrimination). Moreover, hospitals would prefer their payment to be based on their actual (or budgeted) costs, without regard to how these costs relate to some aggregate target (or cap).

On the other hand, administrators of governmental programs are primarily interested in total program expenditures and only secondarily (if at all) concerned with the effects of their payment policies on private payers. Moreover, a highly cost-conscious state Title XIX program would be less than enthusiastic about delegating its budget control responsibilities to a budget and rate review system that is not constrained by an aggregate control.

It appears that a feasible method of accommodating industry and payer concerns is through an aggregate target. California's

Title XIX program must develop budgets two years in advance to accommodate the governmental budgeting cycle. An aggregate forecast, relating to both public and private expenditures, could be generated well in advance of the prospective fiscal year and continuously refined prior to final approval of the Title XIX budget by the Legislature.

Budgets and rates could then be reviewed based on this aggregate statewide forecast and adjusted to not exceed this forecast. The forecast could be identified by source of payer to aid third-party payers in developing budgets for their programs and to serve as an external check on their budgets.

If, for example, the State adopted a Title XIX budget significantly below the AEF projection, the add-on that would have to be applied to rates to be paid by all other payers would be immediately identifiable. Moreover, the AEF would be adopted through public hearings, providing a public forum where all affected parties could debate the reasonableness of the coming year's aggregate projection.

Incorporation of the AEF mechanism in the budget and rate review process has the following advantages: (1) provides strong cost containment potential; (2) provides government and other third-party payers with essential predictability and control; (3) avoids the use of arbitrary ceilings and permits use of budget and rate review, thus providing hospitals with substantial managerial discretion and the motivation to effectively budget and plan for their future operations; (4) provides a public forum to assess the aggregate forecast; and (5) provides a strong

incentive for Title XIX to budget in a manner consistent with the public interest.

2.1 Use of the Aggregate Expenditures Forecast

The Aggregate Expenditures Forecast would be generated prior to budget submission. It would serve as a ceiling on the aggregate of the approved budgets. The Aggregate Expenditures Forecast would act as an initial screen comparing percent increases on a per discharge cost basis and as an adjustment prior to approval of final budgets. In the latter case, all approved budgets would be aggregated, compared with the AEF, and all adjusted by an equal percentage to make the two aggregates equal prior to final approval. If the difference between the two aggregates is substantial (e.g., greater than four percent), the entire process will have to be evaluated and programs of selected hospitals changed. The Aggregate Expenditures Forecast would incorporate a two percent add-on to be retained by the Rate Review Board for possible rate adjustments occurring through exceptions or appeals during the prospective year. The use of the AEF within the screening process is discussed below in Section 4.

a. Generating the Aggregate Expenditures Forecast

The preferred methods of generating the AEF would involve use of a tested structural model, developed and refined over time. The following framework is suggested for use in the long-run implementation of the system:

(1) $C_{it} = f_1(A_{it}, B_{it}, CASEMIX_{it}, SVCMIX_{it}, P_{it}, t)$

(2) $A/POP_{it} = f_2(B_{it}, t, I_{it}, W_{it}, H_{it}, WELF_{it}, PHYS_{it}, AGE_{it})$

(3) $CASEMIX_{it} = f_3(B_{it}, t, I_{it}, W_{it}, H_{it}, WELF_{it}, PHYS_{it}, AGE_{it})$

Equation (1) is an aggregate cost function and equations (2) and (3) are aggregate demand functions, to be estimated on pooled time series-cross section observations on county aggregates. The terms in the equations are as follows:

C_{it} = aggregate hospital costs in county i in period t;

A_{it} = total short-term admissions in county i in period t;

B_{it} = total short-term beds in county i in period t;

$CASEMIX_{it}$ = case mix index in county i in period t;

$SVCMIX_{it}$ = service mix index in county i in period t;

P_{it} = index of input prices in county i in period t;

I_{it} = per capita income in county i in period t;

W_{it} = average earnings in county i in period t;

H_{it} = morbidity variables in county i in period t;

$WELF_{it}$ = proportion of population on welfare in county i in period t;

POP_{it} = total population in county i in period t;

$PHYS_{it}$ = physicians per 1,000 population in county i in period t;

AGE_{it} = age distribution in county i in period t; and

t = time.

The above linear equations are identifiable (three endogenous variables--C, A, CASEMIX), and the system can be estimated by a variety of simultaneous equations estimation procedures (e.g., 2SLS, 3SLS, FIML). Given sufficient data, equations (2) and (3) could be in the form of a larger set of equations, with each equation representing the demand for admissions in a particular diagnostic group. For our purposes the case mix index could take one of three forms:

(1) Several principal components based on case mix proportions (see Zaretsky, 1974b).

(2) An information theory index (see Evans and Walker, 1972).

(3) A Laspeyres index, based on diagnosis proportions, where average charge per diagnosis (statewide) represents the weights. An index to be investigated is:

$$I_i = \frac{\sum_j \bar{c}_j P_{ij}}{\sum_j \bar{c}_j P_j},$$

where:

I_i = case mix index for hospital i;

$\bar{c}_j$ = mean per case charge, statewide, for diagnosis j;

P_j = proportion of patients, statewide, of diagnosis j;

P_{ij} = proportion of patients, with diagnosis j, in hospital i.

The service mix index could also take several forms. For example, several dummy variables could be included representing different levels of service scope (Berry, 1973), or a single index could be employed (Edwards, et al, 1972).

The input price index would be based on the HIPPI, using the input mix in each county. Insurance status is not included since such data are not available at the county level.

For purposes of immediate implementation, a less rigorous approach incorporating trend extrapolations could be used based on historical data obtained from Title XVIII and Title XIX cost reports. These data could be supplemented by aggregate cost data on Part A expenses under Medicare, American Hospital Association Annual Survey data and aggregate Medi-Cal cost estimates. As an example, forecasts were generated for the Sacramento/Sierra Health Service Area (the study area for the Phase II Proposal).

In order to forecast aggregate expenses of the 25 hospitals in the Sacramento/Sierra Health Service Area, a historical data base was developed. This data base was comprised of data from the following sources:

Sources	Data	Years
Medi-Cal Cost Reports	Inpatient	1972,73,74
Medicare Cost Reports	Inpatient & Outpatient	1972,73,74
Foundation Community Health Plan	Inpatient & Outpatient	1972,73,74
State Department of Health, Month-of-Payment Data	Outpatient	1972,73,74,75
American Hospital Association Annual Survey Tape	Inpatient & Outpatient	1972,73,74

From the actual data we were able to estimate, for preliminary illustration purposes, projected total expenses of the 25 hospitals, as well as the Medi-Cal and Medicare shares of those expenses under an equal payment system. The presumption underlying the equal pay system estimates was that all payers would pay according to expenses incurred, with no pass-through of government's share to the private sector. These preliminary estimates indicate the 25 hospitals will spend $225 million for inpatient and outpatient care in fiscal year 1977. Of this, Medi-Cal is expected to incur 20.0 percent of the expenses, for an equal payment liability of $45 million, and Medicare is expected to incur 33.4 percent of the expenses, for an equal payment liability of $75.3 million.

Appendix B describes in detail how these estimates were derived. Included in that appendix are:

(1) Estimates for the Sacramento/Sierra Experiment: Medi-Cal, Medicare, and other (Table 1);

(2) Medi-Cal Estimates: Sacramento/Sierra Experiment (Table 2);

(3) Medicare Estimates: Sacramento/Sierra Experiment (Table 3);

(4) Sources and Description of Actual Data (Table 4);

(5) Methodology Detail for Sacramento/Sierra Experiment Estimates.

It should be emphasized that these projections are presented only for purposes of illustration. This particular method is not being recommended as part of the proposed system; nor are these estimates recommended. No cost containment assumptions were built into these projections.

3. Hospital Input Prospective Price Index (HIPPI)

3.1 Introduction

A hospital input price index will be used to deflate each hospital's budget prior to review. This index is based on each institution's unique input mix, relating major expense items to nationally published indexes (e.g., components of the Consumer Price Index (CPI) and the Wholesale Price Index (WPI)).

The Hospital Input Prospective Price Index (HIPPI) is a Laspeyres index, or base period weight index. For each hospital a representative "market basket" of inputs from the first year of Disclosure reporting (1975) will establish the weights. Accounts from the Natural Classification of Expenses of the California Hospital Accounting Manual are the input categories.[12] Adjustments to the "market basket" will occur every two or three years. The possibility of using a chain index should be explored.

Given the base year "market basket," a set of weights (distribution of expense items) is established for each hospital. To these weights are applied corresponding price changes, reflected in various published price indexes (e.g., various

[12]California Health Facilities Commission, California Hospital Accounting Manual, Sacramento: The Commission, 1974.

national and regional components of the Consumer Price Index and the Wholesale Price Index). The sum of the weights times the price changes yields the index for each hospital. Consider the following simple example:

Assume Hospital A has only two categories of expenses, labor and supplies, accounting for 75 and 25 percent of its 1973 (base year) total expenses, respectively. Assume further that the Wholesale Price Index indicates a change from 1973 to 1974 in labor prices of ten percent and in supply prices of five percent. The index is then calculated as follows:

Input Category (1)	Weight (2)	Price Change (3)	Hospital Price Index (2) x (3) (4)
Labor	.75	1.10	.83
Supplies	.25	1.05	.26
Total	1.00		1.09

Then, Hospital A faced an "uncontrollable" increase in input prices of nine percent from 1973 to 1974.

Each item in the "market basket" has been matched to a specific price index. The Consumer Price Index, Wholesale Price Index and Proxy/Composite Indexes are used. Approximately 50 expense categories, related to 50 proxy indexes will be used.

3.2 Hospital Input Prospective Price Index (HIPPI)

The goal of the Hospital Input Prospective Price Index is to establish an index for each hospital that reflects the total hospital price increase attributable to inflationary pressures

beyond the control of the hospital management. The Hospital Input Prospective Price Index is a Laspeyres formula for an annual price index. To define a Laspeyres index, a base year must be selected as a reference point--in our case the first year of Disclosure reporting (1975). The Natural Classification of Expenses (NCE)[13] has been used as the categories of expenditure. This may be defined as follows:

$$\text{HIPPI} = 100.0 \times \frac{\text{Total Cost of Base Year Quantities at Current Prices}}{\text{Total Cost of Base Year Quantities at Base Year Prices}}$$

The two components of a Laspeyres index are the base period weight and the inflation rate of each input category. Base period weights are determined by taking the proportion of expense per NCE account to total hospital expense. Base period weights will reflect the base period "market basket" of hospital inputs. The Hospital Input Prospective Price Index for a given year will equal the weighted sum of the proportionate price increases (inflation rate times the base period prices) of all the NCE accounts. In this way the HIPPI will be a single number that will project the total increase in hospital costs assuming no change in quantity or mix of inputs.

The second component, inflation rate per input category, requires the matching of input categories to CPI or WPI classifications. Where this match could not be achieved, approximations and proxies were formulated. For this presentation, hospital costs have been divided into: (1) Wages

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[13]California Health Facilities Commission, op. cit.

and Salaries; (2) Employee Benefits; (3) Commodities; (4) Other Direct Expenses; (5) Professional Fees and Purchased Services; (6) Capital Financing; and (7) Transfers.

(1) Wages and Salaries

Adjusting for wage level increases in hospitals is a particularly difficult task. Since hospitals are the greatest consumers of medical personnel, hospitals influence the labor market (monopsony power) and subsequently, the wages paid for medical personnel in their local area. Thus, indexes to establish parity between hospital employees and other professionals on the basis of educational attainment, task responsibility, decision-making authority and supervisory requirements were developed.

The NCE Labor accounts are as follows:

NCE Number	Description
.00	Management and Supervision
.01	Technician and Specialist
.02	Registered Nurses
.03	Licensed Vocational Nurses
.04	Aides and Orderlies
.05	Clerical and Other Administrative
.06	Environmental and Food Service
.07	Physicians
.08	Nonphysician Medical Practitioners
.09	Other Salaries and Wages

Salary and Wage Indexes (SWIs) were developed as proxies to these categories according to the parity criteria. Each of the five SWIs is composed of five wage categories from the National Survey of Professional, Administrative, Technical and Clerical Wages. Each wage category is given equal weight in determining the SWI.

The five SWIs are shown below:

Salary and Wage Index (SWI)

INDEX	WEIGHT
SWI 1 Aggregate percentage change (equal weights) of:	
Attorneys, Level VI	.2
Chemists, Level VIII	.2
Engineers, Level VII	.2
Chief Accountants, Level IV	.2
Personnel Directors, Level IV	.2
SWI 2	
Attorneys, Level III	.2
Chemists, Level IV	.2
Engineers, Level III	.2
Accountants, Level IV	.2
Personnel Directors, Level II	.2

INDEX	WEIGHT
SWI 3	
Attorneys, Level II	.2
Chemists, Level III	.2
Engineers, Level II	.2
Accountants, Level III	.2
Personnel Directors, Level I	.2
SWI 4	
Percentage change in average wage for clerical employees.	
SWI 5	
Percentage change in average hourly earnings of nonsupervisory workers in private sector.	

To accommodate the situation where different quantities of labor are purchased, separate accounts for the various types of labor inputs should be maintained. A full-time equivalent (FTE), such as 40 hours per week, 50 weeks per year, should be established for each category. Total costs per NCE wage account should be divided by total FTEs/year to determine cost/FTE/year.

The NCE Labor accounts with appropriate indexes are as follows:

NCE Number	Description	Index
.00	Management and Supervision	SWI 1
.01	Technician and Specialist	SWI 2 or 3
.02	Registered Nurses	SWI 2
.03	Licensed Vocational Nurses	SWI 3
.04	Aides and Orderlies	SWI 5
.05	Clerical and Other Administrative	SWI 4
.06	Environmental and Food Service	SWI 5
.07	Physicians	SWI 1
.08	Nonphysician Medical Practitioners	SWI 2 or 3
.09	Other Salaries and Wages	SWI 5

The following example relates to wage increases from the base year to the next year for Registered Nurses.

RN HOURS	FTE*	TOTAL EXPENSE	EXPENSE PER FTE	PROJECTED CHARGE IN SWI 2	PROJECTED WAGE PER FTE
20,000	10	$120,000	$12,000	10%	$13,200

*2,000 Hours Per Year = 1 FTE

(2) Employee Benefits

Employee Benefits should be adjusted on an item-by-item basis due to predictability of category price increases.

NCE Number	Description
.10	FICA
.11	State Unemployment Insurance and Federal Unemployment Insurance
.13	Group Health Insurance
.14	Group Life Insurance
.15	Pension and Retirement
.16	Workmen's Compensation
.17	Other
.12	Vacations etc. should be incorporated into definition of FTE.

(3) Commodities

Developing a Medical Supply Index (MSI) is complex. Gort[14] employs the WPI industrial commodity index and Harbridge[15] uses the WPI industrial commodities with Machinery and Equipment, Furniture, Transportation Equipment and Miscellaneous products removed. However, this left in some highly questionable commodities such as

[14] M. Gort, "Report on the Hospital Price Index for Greater New York," Unpublished, 1974.

[15] Measuring Hospital Inflation, Boston: Harbridge House, Inc., 1974.

Industrial Chemicals, Rubber for Tires and so on, that had little application to medical supplies. As such, the MSI was developed to include equal weights of Plastics and Resins, Metals and Metal Products, Nonmetallic Mineral Products, and Drugs and Pharmaceuticals. As more data become available on actual hospital inflation, more accurate indexes can be developed.

NCE Number	Description	Index
.31	Prosthesis	MSI
.32	Sutures and Surgical Needles	MSI
.33	Surgical Packs and Sheets	MSI
.34	Surgical Supplies - General	MSI
.35	Anesthetic Materials	MSI
.36	O_2 and Other Medical Gases	MSI
.37	IV Solutions	MSI
.38	Pharmaceuticals 06-3	WPI:06-3 "Pharmaceutical Preparations"
.39	Radioactive Materials	MSI
.41	Other Medical Care Supplies	MSI

All but one of the above items have been pooled because of the unique properties of medical supplies.

NCE Number	Description	Index
.40	Radiology Film	WPI 15-4 "Photographic Equipment & Supplies
.42	Food-Meat, Fish, Poultry	WPI 01 Raw Food
.43	Food--Other	WPI 02 Processed Food

For number .43, the animal feed component is removed, based on its weight in the processed food component.

NCE Number	Description	Index
.44	Linen and Bedding	WPI 03 (Textile Products from Commodity Group)
.46	Office and Administrative Supplies	WPI: Office Supplies
.47	Employee Wearing Apparel	WPI: 2328 Work Clothing
.48	Instruments and Minor Medical Equipment	WPI 3611
.49	Other Minor Equipment	Electric Measuring Devices
.50	See end of Commodities	
.77	Electricity	WPI 05-42-1927
.78	Gas	WPI 05-31-0101
.79	Water	As projected by local utility.
.80	Other (Petroleum Products)	WPI 05-73-0201.05
.81	Insurance-Professional Liability	As these amounts are predictable and beyond hospital jurisdiction, they should be reimbursed totally. For budgeting purposes, use base period costs plus documented price increases.
.82	Insurance-Other	
.83	Licenses & Taxes (except income)	
.85	Telephone/Telegraph	
.86	Dues and Subscriptions	
.87	Outside Training Session	CPI Western Region All Items
.88	Travel	CPI Transportation: Public

NCE Number	Description	Index
.50	Other Nonmedical Supplies	Choice: (1) A hybrid WPI weighted to include those components excluded from other classifications. (2) WPI Total Manufacturers Non-Durables. (3) MSI
.84	Other Unassigned Costs	
.89	Other Expenses	

(4) Professional Fees and Purchased Services

NCE Number	Description	Index
.20	Medical-MD	SWI 1
.21	Medical-Therapist and Other	SWI 2
.22	Consulting and Management Fees	SWI 1
.23	Legal--Attorney	Attorneys, Level VI
.24	Audit--Accountant	Chief Accountant, Level IV
.25	Other	Specify
.61	Medical	SWI 1
.62	Repairs and Maintenance	SWI 5
.64	Management Services	SWI 2
.66	Other Purchased Services	SWI 2/Specify
.63	Medical School Contracts	Specify
.64	Collection Agencies	No Adjustment

(5) Capital Financing

NCE Number	Description	Index
.71	Depreciation & Amortization-Land Improvement	No Adjustment
.72	Depreciation & Amortization-Buildings & Improvements	
.73	Depreciation & Amortization-Leasehold Improvement	
.74	Depreciation & Amortization-Equipment	
.75	Rental/Lease Costs-Building	No Adjustment
.76	Rental/Lease Costs-Equipment	

A retrospective adjustment for interest expense rate variance can be made.

(6) Transfers

NCE Numbers .91-.94 do not need adjustments.

NCE Number	Description	Index
.91	Transfers to Other Hospital Departments-Labor	No Adjustment
.92	Transfers to Other Hospital Departments - Supplies and Other Expenses	
.93	Transfers from Other Hospital Departments - Labor	
.94	Transfers from Other Hospital Departments - Supplies and Other Expenses	

The system has been designed to incorporate both price and quantity changes to account for hospital cost changes. This index can be aggregated across NCEs to determine total hospital inflation and changes in quantity and in total costs. The base period would be updated every three years. The possibility of using a chain index should be explored.

3.3 Projecting the Index

A mechanism should be established whereby hospital inflation by specific input, facing individual hospitals or all hospitals, can be separated from hospital cost increases.

A relatively simple projection model (used by Gort) could be employed:

$$P_{i,t} = a + b\, P_{i,\, t-1} + b_2\, g_t + b_3 g_{t-1} + u_t,$$

Where $P_{i,t}$ is the price index for commodity i in period t; g_t is the GNP deflator value for period t and u_t is the error term. Thus, each relevant price index component is related to the overall GNP deflator. Forecasts of the latter are available from a variety of sources (e.g., econometric forecasting services, National Bureau of Economic Research).

A more reliable method to be considered involves projecting the specific index categories on the basis of a macroeconometric model. For example, relationships between individual WPI, CPI, or wage indexes and particular macroeconomic variables and more aggregate price variables could be estimated and forecasts of the specific indexes generated from forecasts of the macroeconomic variables. The latter could be obtained from a number of macroeconometric models (e.g., Data Resources, Inc., Wharton, University of California at Los Angeles).

Once the necessary index components are projected, a weighted sum is calculated for each hospital based on its base year distribution of expenses among the accounting classifications identified above.

4. Screening Process[16]

The screening process is a computerized, multistage system, where detailed review is by exception. The screening system has been partially implemented (Steps 5, 6, 7 and 13, see below) and is available for use in an interactive mode. All parameters can be manipulated interactively. Full implementation of the system requires more detailed data than currently available. In particular, one of the screening stages is based on Multiple Rate System (MRS) cost centers. These are modified inclusive rate centers, where all ancillary costs are allocated to several routine cost centers. The MRS is explained in Section L below. Prior to implementation of that stage, similar screens could utilize groupings of existing cost centers (e.g., nursing, ancillary, administration, overhead). Departmental data, currently not available, will soon be forthcoming through Disclosure.

4.1 Goals of Screening System

(1) Review each budget to ensure that it reflects efficient production of hospital services.

(2) Consider aggregate hospital expenditures statewide.

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[16]This proposed screening process draws substantially on the one presented in the California Health Facilities Commission, "A Proposed Budget and Rate Review System for California Hospitals." While the overall approaches are similar, they differ regarding a number of screening steps (e.g., inflation, volume, inclusive cost centers, adjusting to the AEF).

(3) Minimize regulatory costs (i.e., emphasize mechanical screens, with detail review by exception).

(4) Preserve opportunity for substantial managerial discretion by centering the review on the total budget rather than individual line items and incorporating a rate of return mechanism for all hospitals.

(5) Consider a wide variety of cost-influencing variables and trade-offs among cost components by using a multistage screening process. The basic principles underlying this process are: (a) Early screens are fairly aggregate (i.e., total cost per admission); and (b) later screens, which are more detailed, tighten for those institutions identified as costly in the earlier screens; and, conversely, loosen for those hospitals passing the earlier screens.

4.2 Assumptions

(1) All hospitals' budget submissions are based on uniform accounting and budgeting. The hospital will submit operating, capital and cash flow budgets, current year financial statements based on six months' actual and six months' estimated data, and the previous year's actual financial data. In addition diagnostic mix data, on all patients, would be available consistent with the Uniform Hospital Discharge Data Set. Patient mix data would cover the current six-month period and the previous six months. (While diagnostic mix data are not currently available on all hospitals, some proxies are forthcoming through Disclosure; i.e., discharges according to clinical division).

(2) The hospital grouping system is sound. (The grouping methods are discussed below in Section G.)

(3) The health facilities planning process will be operational, effective and consistent with the budget review process. (This is discussed above in Section A.)

(4) Utilization review processes in each hospital will be effective as will be the PSRO.

(5) The licensing process will be effective and the budget and rate review process will be coordinated with licensing standards.

(6) An aggregate (statewide) hospital expenditures forecast will serve as a starting point for the budget review process and will also serve as an ending point through its constraint on the aggregate of the approved budgets.

(7) An exceptions process will be available for hospitals to justify budgets that do not pass the screening process.

(8) A judicial review process will be available to hospitals not wishing to accept Board decisions.

4.3 Outline of Screening Process

(Figure 3 provides a flowchart of the screening procedure.)

(1) Facility submits budget.

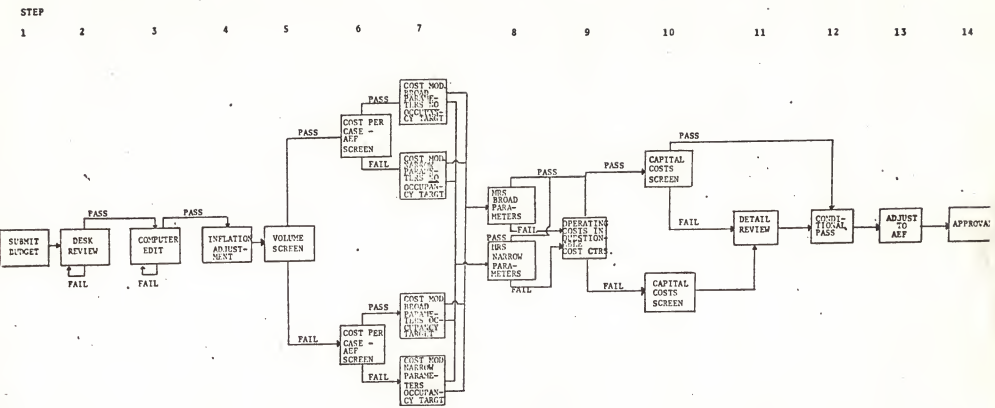
(2) Desk review for completeness and accuracy.

(3) Keypunch data and machine edit.

(4) Deflate each budget to base year prices using HIPPI.

(5) Screen on volume projections.

(6) Screen on total inpatient costs per discharge, relating peer group median cost to aggregate expenditures forecast.



SCREENING PROCESS

FIGURE 3

(7) Cost model screen on cost per discharge, incorporating adjustments for volume, service mix and case mix variation.

(8) Screens on inclusive unit costs--Multiple Rate System (MRS) (e.g., per discharge pediatric including all ancillary costs).

(9) Screens on operating costs in questionable inclusive cost centers.

(10) Capital costs screen.

(11) Detailed review as necessary.

(12) Conditional pass.

(13) Adjust aggregate of conditionally passed budgets to Aggregate Expenditures Forecast less two percent (to be held in reserve for appeals and midyear adjustments).

(14) Approval.

4.4 Description of Individual Steps

(1) Facility Submits Budget

Budget to be submitted in a uniform format using uniform accounting (see Section O below). Operating, capital and cash flow budgets will be submitted three months prior to the prospective year, based on six months' actual and six months' projected data. Budget submission will include the previous year's financial information, also in uniform format. In addition historical case mix data, consistent with the Uniform Hospital Discharge Data Set (UHDDS), will be available for each hospital for the last six months of the previous year and the first six months of the current year. Most screens are applied to the total budget (operating costs and capital costs).

(2) Desk audit for completeness and accuracy to minimize probability of mechanical errors hindering the screening process.

Rate Review Board staff will desk audit all budget submissions, contacting individual hospitals when corrections and verifications are necessary.

(3) Keypunch data and perform computer edit.

As in the previous step, individual hospitals will be contacted when necessary.

(4) Deflate each budget to base year prices using Hospital Input Prospective Price Index (HIPPI). (This index is discussed in detail in Section 3 above.)

The purpose of this step is to recast each budget in terms of base year prices so that only real changes (e.g., programs, services, volume) are evaluated in the screening process. As stated above, HIPPI is a Laspeyres index, reflecting the unique input mix of each hospital. Moreover, input unit price changes are measured by published national and regional indexes and are thus exogenous, reflecting the "uncontrollable" input price increases faced by hospitals. Use of this index provides a strong incentive for hospitals to bargain hard with labor and vendors.

(5) Screens on Volume

In addition to this screen, end-of-year volume adjustments will be applied (see Section C below).

One of the primary purposes of the proposed rate review system is to gradually eliminate current and prevent future capital redundancy. At the same time, the system is

intended to discourage overutilization of services (e.g., unwarranted hospitalizations, unnecessary services).

The major lever on redundant capital will be the planning process. However, through the volume screen, the rate-setting process will at least provide a negative incentive regarding worsening occupancy. The end-of-year volume adjustments are intended to discourage overutilization of services. These adjustments are intended to complement utilization review and PSRO activities.

The proposed volume screen is mild and is only intended to prevent hospitals from underestimating volume for the prospective year to justify higher than expected unit costs. This screen involves adjusting downward a budget based on lower volume than the previous three years' average for that hospital, unless the hospital has an approved plan for phasing out certain of its programs.

In the case of a facility projecting a decreased occupancy, the average of the last three years' occupancy becomes "target" occupancy for the prospective year. This occupancy rate is input to the cost model screen (step 7). Thus, the cost model will predict cost per discharge that would occur at the target occupancy level.

When the data base and forecasting ability improve, a more rigorous screen could be applied. (This would be particularly necessary if the planning process breaks down.) A modest increase in occupancy could be "forced" through the target occupancy concept among the lower than average

occupancy hospitals. However, this method requires ability to project average changes in volume by type of service, since volume changes vary substantially across services.

- Hospitals would be arrayed within peer groups according to base year occupancy rates (based on licensed beds). Peer groups would strictly be based on similarity of service mix and licensed bed size.
- Average occupancy would be projected for each peer group.
- For hospitals below the base year peer group average occupancy, calculate one-half the difference between their base year occupancy and the projected peer group median occupancy. This will then be the target occupancy for the prospective year (i.e., rates should be consistent with target occupancy).
- For hospitals equal to or above the peer group median occupancy, target occupancy will be the greater of budgeted or base year occupancy.

(6) Cost per discharge--AEF screen

This general screen is intended to identify hospitals whose unit costs appear high relative to their peers and/or are increasing by a greater amount than the AEF.

- The AEF is established through analysis of historical data combined with assumptions regarding the prospective year; for example, economic conditions, demographic projections, desired utilization patterns (see Section A above).

- The AEF is then deflated to base year prices using the average input mix applied to the HIPPI. The deflated difference between the AEF for the prospective year and the current year estimate of aggregate expenditures reflects real changes in the aggregate (volume, programs, services).
- The aggregate (inpatient) cost increase per discharge is then calculated using a forecast of aggregate discharges. (This results in the real aggregate cost increase per discharge in base year prices.)
- Calculate current year median inpatient cost per discharge for each peer group of hospitals. Hospitals will be grouped according to size, location and scope of service. (See Section G below on grouping.)
- Hospitals are then arrayed within peer groups based on current year per discharge costs.
- Hospitals whose current year per discharge costs are below their peer group's median would be allowed budgeted increases in cost per discharge up to the percent increase obtained from the AEF. For example, if hospital A had current year per discharge costs of $1,000 and its peer group median was $1,100, it would be allowed the percentage increase suggested by the AEF. If the latter indicates a five percent real increase, hospital A would be allowed to budget cost per discharge of $1,050 in base year dollars.

- Hospitals whose current year per discharge costs are above their peer group median would only be allowed budgeted cost increases below the AEF according to a sliding scale. For example, hospitals whose costs are above the 90th percentile of their group would be allowed no (real) increase; hospitals in the 80th-90th percentile would be allowed 40 percent of the AEF increase; hospitals in the 70th-80th percentile would be allowed 70 percent of the AEF increase; hospitals in the 60th-70th percentile would be allowed 90 percent of the AEF increase; and hospitals in the 50th to 60th percentile would be allowed 95 percent of the AEF increase.
- Hospitals with budgeted increases within the above guidelines pass this screen and will be judged within broader parameters in the next screen than will hospitals that fail this step.

(7) Cost Model Screen

This process is based on a cost function relating cost per discharge to volume, utilization, service mix and case mix. Thus, if a hospital passed the above screen solely because it has a relatively easy case mix, it should be isolated on this screen, and conversely. A cost function of the following form would be used:

Cost/Discharge = f(Discharge, Occupancy, Length of Stay, Case Mix, Service Mix)

in linear or log-linear form. Here case mix would be represented by principal components or factor scores calculated on diagnostic mix proportions, and service mix would be based on a series of dummy variables representing levels of scope of service (Berry, 1973) or a Guttman index developed on services (Edwards et al, 1972). Such cost functions are discussed extensively in Zaretsky (1974b).[17]

The cost function is to be estimated on data from all hospitals (statewide) based on prior year's (year prior to current year) data.

- Using the cost function estimates, costs are predicted for each hospital based on the budgeted values of its independent variables (variables on the right-hand side of the equation). Unless a hospital presents evidence to the contrary, it is assumed the prospective year's diagnostic mix is the same as the current period's (first six months of current year and last six months of previous year).
- Occupancy targets, as defined in Step 5 above, can be incorporated by substituting the target occupancy value for the budgeted occupancy value in the cost model. In Zaretsky (1974b) it was estimated that an occupancy increase from 67 to 85 percent would decrease per case costs by about $50 (1971 dollars). Thus, if for a

[17]Section 4.6 below reports on preliminary testing of the screening system, utilizing a specific cost function specification.

particular hospital, target occupancy were 85 percent and budgeted occupancy were 67 percent, predicted costs based on the former would be $50 less than predicted costs based on budgeted occupancy.

- For hospitals passing the Cost Per Discharge--AEF screen (Step 6), budgeted costs within one standard error of costs predicted by the model would be required to pass this screen.[18]
- For hospitals failing the Step 6 screen, budgeted costs would have to be at or below predicted costs in order to pass.

Figure 4 represents a hypothetical cost model application comparing budgeted cost per discharge and cost per discharge predicted by the cost model. The solid (45-degree) line indicates the relationship if budgeted cost equals predicted cost.[19] The individual points represent predicted versus budget cost points for individual hospitals. Thus, for example, point A represents a hospital whose budgeted per discharge costs were $1,000, while its costs predicted by the cost model were $500. Similarly, point B represents a hospital whose budgeted costs of $1,500 per discharge are $500 less than the $2,000 per case costs predicted by the cost model.

The dashed lines indicate the predicted values plus or minus one standard error (assumed to be $150 here). If we

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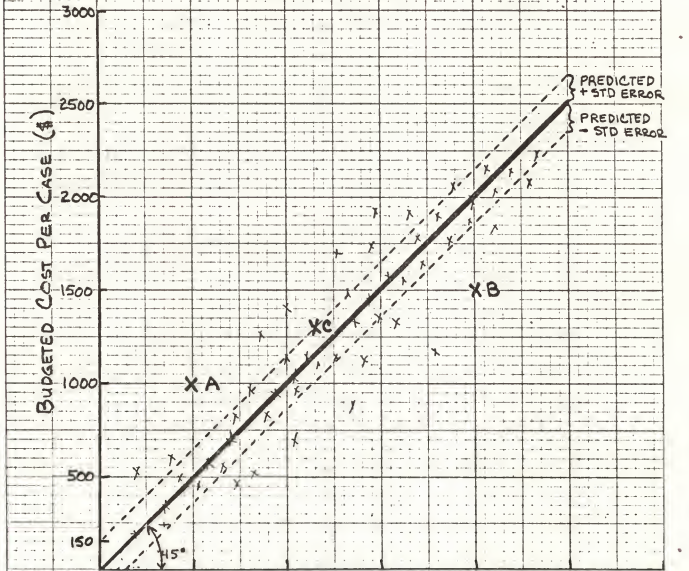
[18]The appropriate statistic here is the "standard error of prediction," see Section 4.6 below.

[19]This example is presented only to illustrate the concept. The standard error of prediction (SEP) does not yield such a uniform display. The SEP varies, nonlinearly, for each prediction.

FIGURE 4

BUDGETED VERSUS PREDICTED COST PER CASE (HYPOTHETICAL)



do not allow a hospital's budgeted cost per discharge to exceed the predicted cost per discharge, all hospitals whose points fall above the 45-degree line would fail the screen (e.g., hospital C would fail). On the other hand, if we permit budgeted cost per discharge to exceed predicted cost by one standard error (i.e., if they passed the earlier cost per discharge-AEF screen), only the hospitals above the upper dashed line would fail the cost model screen (e.g., hospital A would fail but hospital C would pass). In either case, hospital B and all others on or below the 45-degree line (whose budgeted costs per discharge are less than or equal to predicted costs) would pass the screen.

(8) Screens on Inclusive Unit Costs

The objective of this screen is to identify cost centers whose costs require more detailed review. These cost centers are defined according to routine service area, with all ancillary costs allocated to these service areas. (Section L presents a more detailed discussion of these cost centers.) Briefly, cost centers are defined according to routine service (e.g., medical, surgical, ICU, pediatric) with all ancillary costs allocated to these centers. In addition, three levels of care are identified: (1) basic; (2) specialty (e.g., neurosurgery, cardiac care); and (3) special technology (e.g., body scanner). Screens would concentrate on per case costs (per visit for outpatient services) in these categories. This type of unit cost classification would significantly enhance comparability

among institutions. This would also aid the planning process in terms of costing-out and comparing complete programs. It should be noted that outpatient costs are screened in this step for the first time.

- Cost centers would be grouped according to similar characteristics (e.g., size, location, special services, patient mix). Note that cost centers, not necessarily entire institutions, are being grouped.
- For those hospitals that passed the cost model screen in the previous step, unit costs above the 80th percentile will be considered high and subject to the operating cost screen (Step 9). (Note that if a hospital passed the cost model screen, unit costs near the 80th percentile in a given cost center would likely be balanced by unit costs below the median in another cost center.)
- For those hospitals that did not pass the cost model screen in the previous step, unit costs above the median would be considered high and subject to the Step 9 screen.

(9) Screens on Operating Costs in Inclusive Cost Centers

Only those cost centers failing the above (Step 8) screen will be subjected to the operating cost screen. High cost centers will be compared to group medians in terms of operating costs and their components (i.e., labor, nonlabor).

(10) Capital Cost Screen

Capital budgets will be screened against the established rate of return applied to patient care assets. All hospitals exceeding this limit will be requested to file for an exception.

(11) Detailed Review

The problem areas identified in the operating cost component screen will be investigated here. At this point, the hospital will be asked to provide additional data supporting its budget request. For example, if a particular hospital's labor costs are relatively high, it will be requested to submit data on wage rates, occupation mix, CASH standards (if available) and so on. If capital costs are relatively high, a detailed review of the capital budget will be required.

(12) Conditional Pass

Budgets that passed the screens or were adjusted through detailed review are considered conditionally passed. Hospitals contesting the Board's budget decisions will be assigned rates and budgets acceptable through the screening and detailed review process (which could be appealed during the prospective year; see Sections H and I below) while awaiting final rate judgment.

(13) Adjusting to AEF

All budgets, at conditionally passed levels, are aggregated and compared to .98 x AEF. If the aggregate of the budgets is greater than .98 x AEF, all budgets would be

reduced by the same proportion to force equality. If the aggregate of the budgets is less than .98 x AEF, the budgets would not be adjusted.

Budgets would be mechanically adjusted only if small discrepancies (e.g., less than or equal to four percent) between the AEF and the aggregate of the budgets occurred. In the case of larger discrepancies, programs in particular hospitals would have to be curtailed. On the other hand, if the discrepancy is large, there may be justification for upward adjusting of the AEF. Given the initial AEF screen, it appears unlikely that a major discrepancy will result. If program curtailments are necessary, they will be negotiated on an individual basis.

(14) Approval

4.5 Necessary Modifications in Screening Process for Immediate Implementation

Several important modifications and simplifications of the screening process are necessary to enable early implementation (e.g., within two years). On Page 56 above, assumptions necessary for implementation of the screening system were enumerated. Necessary modifications in these assumptions (for early implementation) involve data availability. While the budget format will be uniform, data and budgeting procedures will probably not be as uniform as desired. Most hospitals may not be able to develop inclusive unit cost data as specified here. Moreover, diagnostic mix data may not be available for all hospitals.

Given the above assumptions, the screening process would be implemented following the general procedure outlined above. The only deviations necessary involve Step 7 (Cost Model Screen) and Step 8 (Inclusive Unit Cost Screen). In the former case, the cost model could be estimated excluding diagnostic data; however, service mix data and patient mix among clinical divisions would be included. In the latter case, costs will be compared using functional areas (groups of departments).

Departments will be functionally classified into the following areas:

NURSING	ANCILLARY	SUPPORT	OVERHEAD	ADMINISTRATIVE
Med./Surg.	Lab	Medical	Housekeeping	Accounting
ICU	Radiology	records	Plant Maint.	Business Office
Pediatrics	Operating	Pharmacy	Etc.	Personnel
Obstetrics	room	Dietary		
Etc.	Clinic			Etc.

Output measures for each functional area will also be specified. The following list suggests some measures:

(1) nursing costs/admission;

(2) ancillary costs/admission;

(3) outpatient Clinic costs/visit;

(4) support costs/admission;

(5) overhead costs/square foot;

(6) administrative costs/full-time equivalent.

A hospital group median would be determined for each functional area based on current year budgeted costs and statistics. It should be noted that the outpatient and inpatient expenses could be screened separately here.

The Steps 8 and 9 screens would then be applied to functional areas rather than inclusive cost centers. (It is anticipated the inclusive cost screen could be operational within two to three years.) The remaining screens would proceed as outlined in Section 4.4 above.

4.6 Preliminary Testing of the Screening Process

The screening system was partially tested using 1971-1972 data from the American Hospital Association Annual Survey, Professional Activities Studies (PAS) and California Health Data Corporation (CHDC). These data were compiled through the Hospital Effectiveness Demonstration Project (1972-1974). The major reason for selecting this time period for testing the screens was availability of case mix data.[20]

Available data only permitted application of: (1) the occupancy screen; (2) cost per admission--AEF screen;[21] and (3) cost model screen. Thus, the latter is viewed as the final screen. "Current year" data are assumed to be 1971 and "budget" data are assumed to be 1972. Originally, the cost model was estimated on 1971 data on 176 hospitals. However, merging 1972 data resulted in only 117 complete observations. For our purposes, the "aggregate" was assumed to be 117 hospitals.

Hospitals were grouped into only four classifications due to the small sample size. Grouping is according to service level, following Berry (1973). The principle behind this service delineation is that hospitals go through certain stages of

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[20]Development of these data and the cost model are fully explained in Zaretsky (1974b).

[21]Data were only available for cost per admission. When data become available, cost per discharge will be used.

growth. At first, a given institution offers only basic services. Additions to these services become more and more sophisticated. An assumption is made that if a hospital offers certain services at a given level of sophistication or scope, it offers all services of a lesser level.

Through extensive analysis of AHA Annual Survey data, Berry was able to group hospitals into five general categories (see Table 4). The first category, basic services, is composed of the services a small (new) institution would have to offer to be an acute care institution. As the hospital "grows" beyond this basic capability, it goes through a "quality enhancing" stage where additional services represent enhancements in quality (depth) rather than expansion in scope (breadth). The next additions involve complex services, adding to the hospital's capacity to treat a wider variety of medical conditions.

The "final stage" is encountered when a hospital becomes a community medical center (full service institution) offering outpatient care, home care, social work and so on. Another category, "special services," was identified but it did not represent an expansion of service so it was ignored in the analysis. Hospitals are assigned to one of the four groups based on a simple algorithm reported in Berry (1973), where, if a hospital has four or more of the community services it is assigned to that group, and so on for the other groups. ("Three or more" services were the criteria for the quality enhancing group.)

Table 4

FACILITIES AND SERVICES
COMPOSING "BERRY GROUPS"

BERRY GROUP	SERVICES
Basic	Clinical Laboratory Emergency Room Operating Room Delivery Room X-ray, Diagnostic
Quality Enhancing	Blood Bank Pathology Laboratory Pharmacy with Pharmacist Premature Nursery Postoperative Recovery Unit
Complex	Electroencephalography Dental Facilities Physical Therapy Intensive Care Unit X-Ray, Theraputic Radioisotope Therapy Psychiatric Inpatient Unit Cobalt Therapy Radium Therapy
Community	Occupational Therapy Outpatient Department Home Care Program Social Work Department Rehabilitation Unit Family Planning Service

Source: Berry, Ralph E., Jr., "On Grouping Hospitals for Economic Analysis," Inquiry, Volume X, December 1973, 5-12.

In addition to grouping hospitals according to these criteria, dummy variables based on three of the four groups were included as regressors in the cost function. (Four dummy variables were not included as each regression had a separate intercept term.)

The cost model is estimated on 1971 data. Case mix variables are in the form of principal components calculated on proportions of patients in each of 45 diagnosis groups. Table 5 lists the diagnosis groups. The cost model is specified as follows:

$$COST/ADM_i = a_0 + a_1\ ADM_i + a_2\ OCCUP_i + a_3\ LOS_i + a_4\ S_{1i} + a_5\ S_{2i} + a_6\ S_{3i} + a_7\ URBAN_i + \sum_{j=1}^{12} b_j\ P_{ij} + u_i,$$

where:

$COST/ADM_i$: Cost per admission in hospital i.

ADM_i : Number of admissions in hospital i.

$OCCUP_i$: Occupancy rate in hospital i.

LOS_i : Length of stay in hospital i.

S_{1i} : Equals 1 if hospital i is in Basic service group.

S_{2i} : Equals 1 if hospital i is in Quality service group.

S_{3i} : Equals 1 if hospital i is in Complex service group.

$URBAN_i$: Equals 1 if hospital i is in an urban area (in SMSA).

P_{ij} : Principal component $_j$ (the first 12 principal components are included, explaining 69 percent of the variance of all 44 components).

u_i : error term.

Estimates of this equation are presented in Table 6. Since the HIPPI was not used to deflate budget (1972) data, the model

Table 5

AGGREGATION OF FOUR-DIGIT ICDA CATEGORIES INTO 45 GROUPS

Diagnosis Group

INFECTIVE DISEASES
MALIGNANT NEOPLASMS
BENIGN NEOPLASMS
METABOLIC DISEASES
DIABETES
OTHER ENDOCRINE DISORDERS
HEMATOLOGY
MENTAL DISORDERS
DISEASE OF CENTRAL NERVOUS SYSTEM
DISEASE OF EYE AND EAR
DISEASE OF OTHER NERVOUS SYSTEM
ACUTE CORONARY
OTHER HEART DISEASE
HYPERTENSION
VASCULAR DISEASE
ACUTE UPPER RESPIRATORY INFECTION
HYPERTROPHY OF TONSILS & ADENOIDS
PNEUMONIA & BRONCHITIS
OTHER RESPIRATORY DISEASE
DENTAL DISORDERS
DISEASE OF MOUTH & ESOPHAGUS
DISEASE OF STOMACH AND DUODENUM
APPENDICITIS
HERNIA
OTHER DISEASE OF INTESTINE
DISEASE OF LIVER/GALL BLADDER/PANCREAS
GENITOURINARY DISEASES
DISEASE OF BREAST
DISEASE OF FEMALE GENITAL ORGANS
COMPLICATION OF PREGNANCY
ABORTIONS
NORMAL DELIVERIES
COMPLICATED DELIVERIES
COMPLICATIONS OF PUERPERIUM
DISEASES OF SKIN
DISEASE OF MUSCULAR/SKELETAL SYSTEM
CONGENITAL ANOMALIES
DISEASES OF INFANCY
SYMPTOMS & SIGNS
FRACTURES
OTHER TRAUMA
ADVERSE EFFECTS
SPECIAL SERVICES
BIRTHS
MISCELLANEOUS

Table 6

COST FUNCTION ESTIMATES
(Standard error in parentheses)

Independent Variables	Coefficients	
ADM (Admissions)	0.00296	(0.00375)
OCCUP (Occupancy)	-330.43188*	(135.85256)
LOS (Length of Stay)	22.64636*	(6.84582)
S_1 (Basic)	-203.37613*	(65.67716)
S_2 (Quality)	-120.48816	(68.35696)
S_3 (Complex)	-146.91755*	(51.96193)
URBAN (Metropolitan)	73.12627	(41.61801)
P_1	-35.99644*	(16.90833)
P_2	32.54511	(19.52578)
P_3	-109.02168**	(21.15870)
P_4	-1.52187	(15.34862)
P_5	-53.44263*	(19.52407)
P_6	45.20045*	(16.78921)
P_7	6.70730	(18.41741)
P_8	15.81303	(18.90474)
P_9	31.29714	(16.64506)
P_{10}	4.20388	(18.83525)
P_{11}	-5.67380	(15.49613)
P_{12}	5.10433	(18.01597)
Constant	878.04981	
R^2	0.70268	
Standard error	134.40997	
Number of Cases	117	

*Significant at the .05 level.
**Significant at the .01 level.

prediction and its standard error were inflated by the change in the All Items Consumer Price Index from 1971 to 1972--3.3 percent.[22]

The calculation for the standard error of prediction (prior to the price level adjustment) is as follows:[23]

$$s_{p_i} = s[1 + c_i'(X'X)^{-1} c_i]^{1/2},$$

where:

s_{p_i} : standard error of prediction for hospital i.

s : estimate of standard error of the regression equation.

X'X : moment matrix of independent variables.

c_i : vector of forecasted values of the independent variables for hospital i.

Budgeted values (1972) were inserted in the regression equation to generate the 1972 prediction for each hospital. (It was assumed that 1972 case mix values were the same as 1971.) The relationship between actual and predicted values is illustrated in Figure 5. Note that for each hospital the plotted values were standardized using the individual standard error of prediction. This results in straight lines for the confidence interval boundaries. Twenty-eight estimates (24 percent of the cases) fell outside the (+1, -1) standard errors of prediction confidence interval; seven estimates (five percent) fell outside the (+2, -2) interval.

Table 7 summarizes the screening results. Note that of 117 hospitals, 43 (37 percent) fail the final step. Table 8

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[22]Note that admissions are used here rather than discharges, as specified in Section 4.6 above.

[23]See Johnston (1972), pp. 152-154.

FIGURE 5

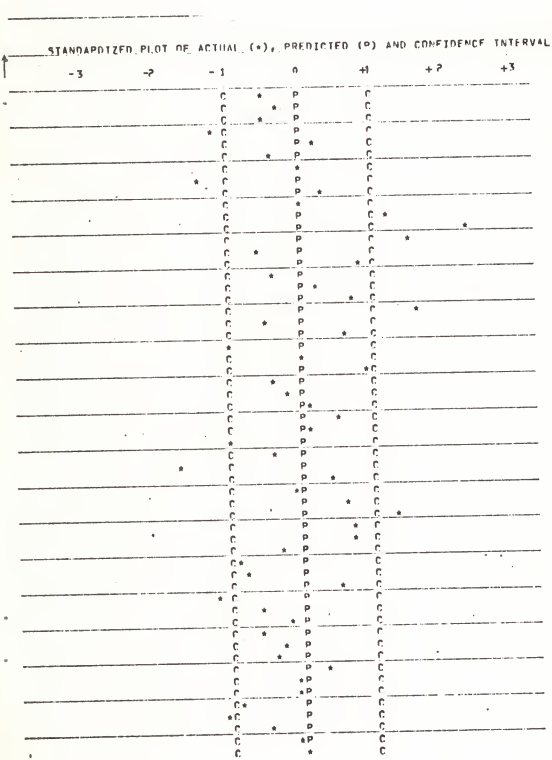
STANDARDIZED PLOT OF ACTUAL (*), PREDICTED (P) AND CONFIDENCE INTERVAL (C) VALUES
-3
-2
-1
0
+1
+2
+3

FIGURE 5 (cont.)

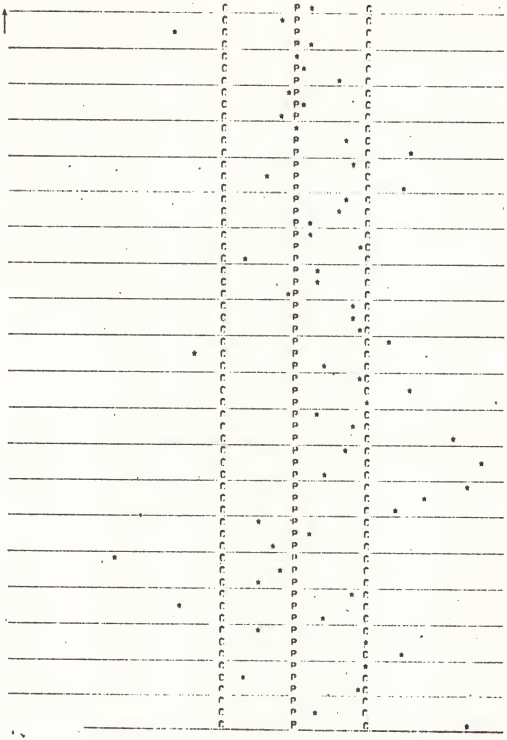

Table 7

BUDGET SCREENING SUMMARY

NUMBER SCREENED	FAILING OCCUPANCY SCREEN	FAILING AEF-COST PER ADM. SCREEN	FAILING COST MODEL SCREEN
117	77	59	43

Aggregate Expenditures Forecast:	$799,838,031
Aggregate Expenditures Allowed :	$736,941,293
Percent Difference :	-7.9

Table 8

BUDGET ADJUSTMENT DISTRIBUTION
(IN PERCENT)

ADJUSTMENT	NUMBER OF HOSPITALS
0 - 1	0
1 - 2	1
2 - 3	2
3 - 4	2
4 - 5	3
5 - 6	0
6 - 7	2
7 - 8	0
8 - 9	0
9 -10	1
10 -15	9
15 -20	9
20 -25	7
25 OR MORE	7

shows the budget adjustment distribution needed to bring the hospitals failing the screens to the "acceptable" level. Resulting aggregate expenditures are $737 million or 7.9 percent below the AEF.

Depending on cost containment objectives and available resources to handle detailed review, the screening parameters can be adjusted. For instance, if two standard errors are allowed those hospitals passing the AEF screen and one allowed those failing it, only 18 hospitals (15 percent) fail the final step and the resulting aggregate expenditures are $777 million, or 2.8 percent below the AEF.

This system is currently implemented in a time-sharing environment. The user may easily manipulate all screening parameters via a highly conversational program interface.

As this system evolves, and hospitals and rate review personnel gain experience, both in cost containment and data reporting, screening parameters can be gradually tightened.

C. Adjustments to the Rate Review Process

Only two types of adjustments are proposed--volume and major unforeseen events (both upward and downward). Neither adjustment would be retroactive. These adjustments would be applied to the subsequent year's rates (year following prospective year). If these adjustments are considered inadequate or inappropriate by an individual facility, the facility may request an exception in the subsequent budget submission.

Volume adjustments would be generally automatic. Adjustments for significant unforeseen events would be initiated by the affected facility. To enhance the prospective nature of the system and enable its applicability to prepayment, adjustments are kept to a minimum. (It would be possible, if experience with the system in its first few years warrants, to incorporate price level adjustments based on actual versus forecasted values of the HIPPI.) At this point, however, we are proposing a minimum of adjustments.

1. Volume Adjustments

Three options for year-end volume adjustments would be available:

(1) The hospital can submit a variable budget based on estimates of costs at three levels of volume: predicted level, predicted level plus ten percent, and predicted level minus ten percent. Each of these budgets would be separately screened. At year-end an adjustment would be made according to the variable budget and included in the rates that would be approved for the following year.

(2) The hospital can submit a list of departments or inclusive cost centers, including the variable to fixed cost ratio in each. The year-end adjustment will be made according to the submitted ratios as long as they are determined to be reasonable.

(3) The hospital can submit its budget and accept a standard estimate of the fixed to variable cost ratio. If it experiences greater than expected volume, it would be allowed only

the costs budgeted for the predicted volume plus the variable cost estimate for the additional volume. If it experiences a lower than expected volume, it would be allowed the costs budgeted for the predicted volume minus the variable costs savings resulting from the lesser volume.

If a hospital becomes aware that it has underestimated its volume, it will be encouraged to set aside excess revenues to offset the rate adjustment that would be made for the following year.

2. Significant Unforeseen Events

Certain events can occur which are clearly beyond the control of the hospital management and/or medical staff. Such events include "acts of God," in addition to epidemics, strikes, and so on. Permissible "events" would be preannounced prior to budget submission and their occurrence during the year will permit a hospital to recoup losses due to these unforeseen events through the subsequent year's rates. Thus, the prospective (contractual) nature of the system is not violated. In extraordinary circumstances, a midyear adjustment may be approved to cover expenses for the remainder of the budget year. This would involve cases where failure to receive a midyear rate adjustment would have serious financial consequences for the affected hospital.

D. Financial Requirements

Financial requirements define the cost elements that are eligible for review. They are divided into two categories: (1) recognized expenses (primarily operating costs); and

(2) capital costs. The proposed system incorporates a rate of return on patient care assets for both investor-owned and nonprofit hospitals. Rate of return would be in lieu of recognized expenses of all economic rents (costs associated with use of an asset) and applied to the book value of all patient care assets.

The total of Recognized Expenses is the total operating expenses as in an operating budget of a hospital and accounted for on an accrual basis. Economic Rents (e.g., interest expenses) are included in the Capital Costs mechanism. Recognized Expenses plus Capital Costs equal the total financial requirements of hospitals.

1. Recognized Expenses

1.1 Introduction

This section defines which operating expenses are recognized in the provision of patient care for payment on an ongoing basis. An expense must be necessary and proper. "Necessary" means, if applicable, that the service or asset is licensed and has a certificate of need; "proper" means that the amount falls within reasonable cost guidelines. Only highlights of particular expenses and categories of expenses that cause concern to hospitals and payers are covered here. For analysis purposes a hospital can be subdivided into the following operating activities:

(1) Daily Hospital Services;

(2) Ancillary Health Services;

(3) Noninservice Educational Programs;

(4) Research Activities;

(5) Activities Not Directly Related to Patient Care.

Those expenses involved in providing (1) Daily Hospital Services and (2) Ancillary Health Services are recognized and recoverable through the rate structure. Expenses associated with (3) Noninservice Educational Programs also are incorporated into the rate structure.

This section covers each of the operating expense accounts as defined in the California Hospital Accounting Manual (CHAM)[24] and applies the patient care criteria for recognizing expenses to each account. (See Appendix D for a list of CHAM accounts.)

The payment mechanism must be based on explicitly defined expenses. Determining total recognized expenses requires defining expenses necessary in providing patient care, guidelines for reasonable costs, and a procedure to allocate costs to revenue centers. This section covers recognized expenses. Reasonable cost involves the magnitude of the expense. Cost allocation assigns expenses to specific revenue centers. Recognized Expenses defines which operating expenses are recognized for payment in the provision of hospital services to a community on an ongoing basis.

Expenses incurred in the process of providing patient care are considered recognized. Two methods were used to segregate a hospital's California Hospital Accounting Manual (CHAM) expense accounts:

(1) the expense account was allocated to all remaining expense accounts using the allocation method stated in CHAM;[25] or

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[24]California Hospital Accounting Manual. Sacramento: California Health Facilities Commission, 1974.

[25]The allocation method is under review for appropriateness in budget and rate review function.

(2) the entire expense account is not allocated.

The following expenses and related revenues support several separate, identifiable activities in a health facility (a health facility need not have all activities):

(1) Daily Hospital Services (Inpatient Services);

(2) Ancillary Health Services;

(3) Noninservice Educational Programs;

(4) Research Activities;

(5) Activities not Directly Related to Patient Care.

Expenses required for providing (1) Daily Hospital Services and (2) Ancillary Health Services are recognized and recoverable through the rate structure. Expenses associated with (3) Noninservice Educational Programs and (4) Research Activities are to be accounted for separately.

The distinction between recognized and nonrecognized expenses relating to patient care must be clearly made; rates should reflect only those expenses related to providing patient care. Subsidizing noninservice educational and research expenses by including them in patient care rates distorts the health care cost picture. This distortion creates problems in hospital cost comparisons, especially between teaching and nonteaching institutions. A separate financing mechanism that supports noninservice educational and research programs would definitely be a preferable payment procedure. However, until such alternative financial support exists, the current realities of health care financing must be incorporated into the rate structure.

Agencies paying for patient care currently provide financial support for educational expenses, though not for research. The justification appears to be that sufficient financial sources outside of patient care charges exist to support research activities. Identifiable research expenses should not be included in the rate structure. However, funds to support research activities may be obtained through the capital cost mechanism or external sources. To accurately accumulate research expenses, an equitable method of allocation must be designed to insure that medical rates cover all expenses directly and indirectly related to patient care, and that research will be allocated its proportionate direct and incremental costs (on allocation method see Section O below).

In general, research activities will be funded through grants and contracts. Certain patient care research activities involving highly specialized care which is recognized as acceptable medical practice, although rare in incidence, could be financed through the rate structure if the hospital provides the service. If the hospital is licensed to offer the specialized service, the special rates will be charged to those patients (payers) receiving the service. In all cases, prospective rates must pass the screening process (reflecting appropriate peer group averages) to be approved. Additional research funds can also be taken from any available surplus provided by the capital cost mechanism.

Although alternative financing mechanisms are available for noninservice education, a process of accounting and payment has

not been developed to clearly distinguish educational costs from patient care costs. Until mechanisms that accurately and equitably bear the burdens of educational expenses are devised, these expenses, within the constraints of the reasonable cost concept, will be recognized as financial requirements of providing patient care, although accounted for separately. By this method the initial purpose and integrity of separately accounting for educational and research costs will be maintained. Patient educational programs should be incorporated in the patient care rates.

Rather than present each account here, the total list of expenses from Page 20 (Lines 1-59) of the California Health Facilities Commission forms, July, 1975 transmittal to the California Hospital Accounting Manual are reproduced in Table 9. Lines 78-128 (CHAM, Page 20) include daily hospital services and ancillary services; expenses in these accounts are recoverable through the patient rates. Each account name is followed by revenue and expense account numbers. Daily hospital services and ancillary services then have a "rate code" method of allocation and statistic which is not of concern here; Multiple Rate System (MRS) explains the meaning of the rate codes (see Section L below). Nonrevenue expense centers have the Recognized Expense code number 1 or 2 and columns for method of allocation and standard unit of measure statistic. Expenses accumulated in each account number are as defined in the California Hospital Accounting Manual. The last two columns have not been filled in but are the same as CHAM regulations.

Table 9

	SYSTEM OF ACCOUNTS		Rate	Method of	
	Revenue (1)	Expense (2)	Code (3)	Allocation (4)	Statistic (5)
DAILY HOSPITAL SERVICES					
Medical/Surgical Intensive Care	3010	6010	A		
Coronary Intensive Care	3020	6020	A		
Definitive Observation	3030	6030			
Pediatric Intensive Care	3040	6040	A		
Psychiatric Isolation	3050	6050	A		
Other Intensive Care Units	3060	6060	A		
Medical/Surgical Acute	3080	6080	G & H		
Pediatric Acute	3120	6120	F		
Psychiatric Acute	3140	6140	D		
Obstetrics Acute	3160	6160	C1, C2		
Nursery Acute	3170	6170	I		
Other Acute Care Units	3180	6180			
Skilled Nursing	3200	6200	B		
Psychiatric Long-Term	3240	6240	B		
Intermediate Care	3280	6280	B		
Residential	3320	6320	B		
Other Long-Term	--				
Other Daily Services (Specify)	3360	6360			
ANCILLARY SERVICES					
Labor and Delivery	4010	7010	C1		
Surgery and Recovery	4020	7020	H		
Surgical Day Care	4030	7030	N		
Anesthesiology	4040	7040	C & H		
Central Services and Supply	4050	7050	a		
Laboratories - Clinical	4060	7060	a		
Laboratories - Pathological	4070	7070	a		
Laboratories - Pulmonary Function	4080	7080	a		
Laboratories - Other	4090	7090	a		
Blood Bank	4100	7100	a		
Electrocardiology	4110	7110	J		
Electromyography	4120	7120	J		
Electroencephalography	4130	7130	J		
Radiology - Diagnostic	4140	7140	a		
Radiology - Therapeutic	4150	7150	P or J		
Nuclear Medicine	4160	7160	P or J		

Table 9
SYSTEM OF ACCOUNTS (cont.)

	Revenue (1)	Expense (2)	Rate Code (3)	Method of Allocation (4)	Statistic (5)
ANCILLARY SERVICES (cont.)					
Pharmacy	4170	7170	a		
Inhalation Therapy	4180	7180	a		
Dialysis	4190	7190	J3		
Physical Therapy	4200	7200	a		
Occupation Therapy	4210	7210	a		
Other Physical Medicine	4220	7220	a		
Emergency	4230	7230	P1 or P2		
Ambulance	4240	7240	P1 or P2		
Psychiatric ER's	4250	7250	P		
Clinics	4260	7260	K, L, M		
Home Health Services	4400	7400			
Other Ancillary Services (Specify)	4410	7410			

a = allocate b = rate, not allocated

Table 9 (cont.)

INDIRECT EXPENSE	Revenue (1)	Expense (2)	Expense[1] Group (3)	Allocation Method (4)	Statistic (5)
*Interest - Other No NCE for Interest		8870	2		
Insurance - Other		8840	1		
Licenses & Taxes (Other Than Income)		8850	1		
Depreciation & Amortization		8810	1	AS IN MANUAL	
*Leases & Rentals		8820	2		
*Interest - Working Capital		8860	2		
Hospital Administration		8610	1		
Governing Board Expense		8620	1		
Public Relations		8630	1		
Management Engineering		8640	1		
Other Administrative Services		8750	1		
Management Services	5740		1		
General Accounting		8510	1		
Communications		8520	1		
Other Fiscal Services (Specify)		8570	1		
Printing & Duplicating		8310	1		
Personnel		8650	1		
Employee Medical Services Adm.		8660	1		
Employee Benefits (Non-Payroll)		8880	1		
Cafeteria	5330	8330	2		
Purchasing & Stores	5420	8420	1		
Housekeeping		8460	1		
Grounds		8430	1		
Security		8440	1		
Parking	5450	8450	1		
Plant Operations	5460	8470	1		
Plant Maintenance		8480	1		
Other General Services		8490	1		
Employee Housing	5380	8380	2		
Physician's Offices & Other Rentals	5390	8390	2		
Dietary		8340	1		
Laundry & Linen	5350	8350	1		
Patient Accounting		8530	1		
Data Processing	5540	8540	1		
Credit & Collection		8550	1		
Auxiliary Groups		8670	1		

[1]See Page 2, Recognized Expense Codes

*Included in Capital Costs.

Table 9

SYSTEM OF ACCOUNTS

INDIRECT EXPENSE (cont.)

	Revenue (1)	Expense (2)	Expense[1] Group (3)	Allocation Method (4)	Statistics (5)
Chaplaincy Services		8680	1		
Medical Library		8690	1		
Medical Records	5700	8700	1		
Medical Staff		8710	1		
Social Services		8360	1	AS IN MANUAL	
Insurance - Prof. Liability		8830	1		
Admitting		8560	1		
Other (Specify)		8890	1		
Other Retail Operations	5400	8400	2		
Nursing Administration		8720	1		
Inservice Education - Nursing		8740	1		
Central Service (w/o Cost of Sales)			1		
Pharmacy (w/o Cost of Sales)			1		
Research Adm. Office		8010	2		
Research Projects		8020	2		
Other Research (Specify)			2		
Education Adm. Office[2]		8210	E	b	
Student Housing	5260	8260	E	b	
LVN Program	5230	8230	E	b	
School of Nursing	5220	8220	E	b	
Paramedical Education	5250	8250	E	b	
Other Education Activities	5270	8270	E	b	
Medical Post Graduate Educ.	5240	8240	E	b	
Research/Educ/Rev. & Transf.					

COST RECOVERIES

Cafeteria Sales
Janitorial & Maintenance Services
Parking Revenue
Employee Housing
Physicians' Offices & Other Rentals
Data Processing Services
Management Services
Purchasing/Stores Services
Medical Records/Abstract
Laundry & Linen Services
Trans. for Operations (Non-Rev Cntrs)
Other Cost Recoveries (Specify)

[1] See Page 2, Recognized Expense Codes b = Rate, Not Allocated

[2] Rate Code Group "E" For All Education Expenses #8210-8270

1.2 Recognized Expenses--Examples

The following are specific cases and should not be considered a comprehensive list. Again, "necessary" means that where applicable a service or asset has been licensed or awarded a certificate of need; "proper" means that the amount falls within approved cost guidelines. In all cases, application of generally accepted accounting principles is assumed.

A complete Recognized Expense Manual using this section as a starting point is necessary. The California Hospital Accounting Manual should be used as the foundation for categorizing expenses and subsequently classifying each expense as recognized or not recognized.

(1) Start-up and Preopening Costs--Necessary and proper expenses amortized by the prevailing procedure used in the hospital, provided the procedure is in accordance with generally accepted accounting principles and court rulings. The hospital should submit a capital budget for review at the time of certificate of need application detailing a long-range plan to cover operations.

(2) Bad Debts--recognized if they meet the following criteria:

- The provider is able to establish that reasonable collection efforts were made.
- Sound business judgment has established that there was little likelihood of recovery.
- The bad debt is not a professional courtesy allowance. Employee allowances to be included in "Employee Benefits: Nonpayroll."

- The bad debt account may be a provision based on sound business practices and historical experience.

(3) Credit Card Costs--recognized as a collection expense.

(4) Allowances related to employment and employees' benefits as a condition of employment are recognized expenses and included in "Employee Benefits: Nonpayroll." These expenses must be necessary and proper.

(5) Gifts, Endowments and Bequests

- If the restricted contribution affects operating revenue for patient services, the contribution amount should be used as an offset to patient charges. Recognized Expenses would not be affected.
- Unrestricted contributions should be used as a general offset to patient charges. Recognized Expenses would not be affected.
- Fund-raising expenses must be netted against associated donations.
- If the expenses of a program, service, or asset are recorded in the budget all associated revenue must also go in the budget.

(6) Parking Expense--parking expenses for employee parking will be recognized. Parking revenue should directly offset parking expenses.

(7) Purchase Discounts, Allowances, and Refund Expenses--discounts and allowances received on purchases of goods and services are a direct reduction in expense to the good or service. Similarly, refunds of previous expense payments are reductions of the related expense.

(8) Compensation of Owners--a reasonable compensation for services related to patient care that owners provide is recognized.

(9) Cafeteria--number 8330--revenue should be used as an offset to expenses.

(10) Student Housing--number 8260--Revenue should be used as an offset to expenses.

(11) Expenses for generally accepted personal amenities like telephone and television are recognized.

(12) Expenses due to regulation or legislation are recognized.

1.3 Nonrecognized Expenses

The following expenses would not be recognized (for review) in the operating budget. However, some of these costs could be recovered through the capital cost mechanism.

(1) Employee Housing--number 8380--employee housing not related to patient care.

(2) Physicians' Offices and Other Rentals--number 8390--physician office expense other than full-time staff and full-time administrators is not recognized. Offices dedicated full-time to part-time staff are recognizable. Expenses of offices partly dedicated to hospital use shall be prorated. Space leased or rented to nonhospital operations (e.g., laboratories, pharmacies) cannot be subsidized by medical care rates and are therefore not recognized.

(3) Other Retail Operations--number 8400--not recognized.

(4) Research Activities--numbers 8010, 8020--not recognized (see preceding pages).

(5) Interest, finance charges and management fees on assets not related to patient care will not be recognized.

(6) Interest on Interfund Loans--not recognized.

(7) All other interest expenses--not recognized.

(8) Charity Allowances and Nonemployee Discretionary Allowances--not recognized. Hill-Burton charity expenses will be included in Capital Costs for determining rates.

(9) Dividend Payment--not recognized.

(10) Charges for patient long-distance calls would not be recognized.

2. Capital Costs

These expenses are to be recovered through the Capital Cost mechanism:

(1) interest expense;

(2) finance charges;

(3) interest component of lease payments;

(4) dividend payments;

(5) income and franchise taxes;

(6) discretionary charity allowances.

2.1 Principles

It is the intention that hospitals budget for and set rates to cover costs associated with the acquisition, preservation and improvement of capital assets that are determined to be needed for patient care through a regional health plan. As with all other categories of costs, capital costs are subject to the necessary and proper criteria. Capital-related cash requirements

are of two types: (1) funds needed to cover the capital costs of financing existing patient care assets; and (2) funds needed to accumulate or attract capital for future expansion, improvement or replacement.

The Prospective Incentive Payment Experiment (PIPE) divides total financial requirements into two major divisions: (1) Recognized Expenses; and (2) Capital Costs. This separation aids in the screening process. Recognized Expenses is the business-operating component and Capital Costs is the financial component. Each of these components has an associated level of risk--business risk and financial risk respectively. Business risk includes the positive and negative consequences of operating performance. Increasing production efficiency would result in a positive business-operating gain. Financial risk includes the consequences of a particular financing structure. For example, a hospital with 80 percent debt exposes itself to more financial risk (greater probability of default on debt payments) than a hospital with 20 percent debt. Risk should be considered to have positive and negative consequences, depending on economic events. The division of Total Financial Requirements into Recognized Expenses and Capital Costs separates the two risk components so that these risk factors can be evaluated independently of each other.

The Rate Review Board will screen budgets against normative guides established from peer group hospitals and approve rates. If the proposed rates are above screen levels, hospitals will only be permitted to charge screen level rates. A hospital could

still have above screen-level rates approved through the exceptions or appeals process.

Even if a hospital passes the screen, there is an incentive to reduce costs since rates are prospectively contracted. By reducing operating expenses, the hospital will achieve a one-time savings (a benefit from business risk). Since year-two rates will be a function of year-one actual costs, the cost efficiency will yield a one-time benefit to the hospital.

When all economic rents in the capital cost component are grouped for analysis purposes, some positive long-term incentives develop (i.e., the hospital can concentrate on reducing its financial risk exposure). For example, hospitals would have a strong incentive to perform financial feasibility studies to determine if a proposed expenditure would increase their capital costs above screen levels.

2.2 Method

To generate sufficient funds to meet a hospital's financial requirements, a percentage return on total patient care assets is proposed to establish the screening level of capital costs for a particular hospital. This standard margin is revenue above the Recognized Expenses detailed above. The concept underlying a return on total assets is that there is a financing cost associated with each asset (a capital cost); and, that by calculating a rate of return on total patient care assets, the method of financing (debt, equity, leasing, etc.) is not influenced by the reimbursement procedure. The rate of return on total assets would include the recognized expenses of all

"economic rents" (costs associated with the use of an asset) associated with patient care assets.

A hospital will submit a complete budgeting package, including operating, cash flow and capital budgets, based on all financial requirements for the budget period. The budgeting package would be used to support the requested rates for operating and capital needs. In cases where the standard margin (patient care assets times the rate of return) fails to cover projected capital costs in the budget, the hospital can request an exception review. (A hospital could also request an exception if operating costs exceeded screens, in much the same manner.) The standard margin has been designed to provide normal capital costs, including large and small expenditures for replacement, expansion and renovation.

The procedure for developing capital cost screens must be supplemented by strong planning guidelines on asset accumulation and capital expenditures, which will be concerned with the aggregate supply of facilities and services. The budget screens will act as one mechanism in reducing capital cost inefficiencies.

Implementation requires the following steps:

(1) definition, identification and valuation of patient care assets;

(2) definition and identification of "economic rents";

(3) determination of the rate of return to be applied toward assets; and

(4) determination of exception review guidelines.

Once the above parameters have been defined, the mechanics of the procedure can be implemented immediately. By using the California Health Facilities Commission Balance Sheet and Cost Allocation, all the appropriate proportions can be calculated and applied in accordance with the principles of Capital Costs.

a. Definition, Identification and Valuation of Patient Care Assets

Patient care assets must be separated from total assets. Patient care assets can be defined as those assets required to provide hospital services in a community. The California Hospital Accounting Manual (CHAM) provides a format and associated account numbers for hospital assets. Since this form is required by the California Health Facilities Commission for Disclosure, CHAM account numbers and definitions have been used.

Since the CHAM requires a consolidated balance sheet of all unrestricted funds, numerous assets unrelated to patient care are included in the total asset figure. In particular, if a hospital owned and operated a medical office building, the total patient care assets would be overstated by the value of the building. A rate of return on the asset value of the building should not be included in the patient care rates.

Marketable securities provide an example of an asset that generates its own income. Since the securities generate a return, including them in the rate of return for patient care assets would be providing a double return.

Specific asset values should be deducted from total assets if they are capable of generating income from nonpatient sources

or are not related to providing patient hospital services. Certain intangible assets will also be deducted from the total asset position. The patient care asset base used in calculating the standard margin will be equal to net working capital, plus current maturities of capital indebtedness plus long-term patient care assets. (See Appendix E for detailed list.)

Patient care assets will be valued at historical acquisition cost.

b. Definition and Identification of "Economic Rents"

Broadly speaking, an "economic rent" is the cost associated with the use of an asset. An interest rate is the rent on money. The application of a rate of return on all assets requires that all economic rents be removed from Recognized Expenses to avoid the double calculation of "rents" when developing screens. The following expenses are identified as "economic rents."

(1) Interest CHAM #8870.

(2) Interest on Working Capital CHAM #8860.

(3) Interest--Necessary and proper interest on both current and capital indebtedness.

- Necessary requires that service or asset must be licensed and certificate of need awarded if applicable.
- Proper requires that the amount falls within approved cost guides.

(4) Finance charge--Necessary and proper finance charges.

(5) Bond discount and expenses--Recognized and amortized over the life of the bond (either straight-line or effective interest method). Entered in bond account number.

(6) Bond premium--Must be amortized as above. Entered in bond account number.

(7) Interest on loans from lenders related to the provider.

(8) Interest paid to restricted fund balances.

(9) Dividend payments.

(10) Finance charge component of capitalized leases.

A procedure is necessary to account for leases and rents such that the entire payment is covered by the rate of return and recognized expenses. The procedure will include a depreciation-like recognized expense based on the contracted liability.

The following procedure or some standardized method for capitalized lease accounting that is consistent with the procedure below will be used. All noncapitalized leases and rentals are to be treated as recognized expenses in the period paid and not included in the patient care asset value.

The objective is to identify leases and rentals that are alternative methods of financing.

The market value of the asset at the time of acquisition should be established through appraisals or purchase options. (The asset must also be a patient care asset as defined in Appendix E.) Alternatively, the "purchase price" could be calculated by using the given interest rate or an imputed interest rate:

"Leased and Rental Patient Care Assets"	
"Building and Improvements"	xxxxx
"Write-down"	(xxx)
"Equipment"	xxxxx
"Write-down"	(xxx)
"Net Leased and Rental Patient Care Assets"	xxxxx

The total contractual liability of the lease or rental agreement should be included in the liability side of the balance sheet and explained in a footnote. A contra-liability account equal to the difference of the total liability minus the asset value (i.e., total interest) should have a separate account:

"Lease Liabilities"	xxxxx
"Contra-Lease"	(xxx)
"Net Lease Liability"	xxxxx
"Rental Liability"	xxxxx
"Contra-Rental"	(xxx)
"Net Rental Liability"	xxxxx

The "write-down" accounts are similar to an accumulated depreciation. Each year the "write-down" value would be included in the Profit and Loss Statement as a recognized expense. Asset values should be written down by the straight-line method. Liabilities plus contra-liabilities should also be amortized on the straight-line method.

The "net leased and rental patient care assets" account must balance with "net lease liability" and "net rental liability" accounts.

Interest expense accounts can be identified easily from the CHAM accounts. Lease and rental payments on noncapitalized assets will be treated as a recognized expense.

All new financing arrangements could be subject to review (through the capital budget) for compliance with necessary and proper criteria (defined above).

c. Determination of the Rate of Return to be Applied Toward Assets

The rate of return should be sufficient to meet individual hospital capital costs. A method for deriving this rate of return for total assets is to determine the cost of capital for the hospital industry.[26] This is illustrated by the following equation:

$$C_C = P_D\ C_B + P_E\ C_E,$$

where:

C_E = cost of equity

C_B = cost of borrowing

C_C = cost of capital

P_D = proportion debt

P_E = proportion equity

$P_D + P_E = 1$

C_B: statewide average

C_E: national indicator

C_C: individual hospital value

Average interest expense (C_B) will be calculated for the California hospital industry from CHFC Disclosure forms. Return on equity (C_E) will be based on national indicators for equally risky investments. C_E and C_B will be proportionately averaged according to a hospital's individual debt structure.

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[26]The cost of capital concept states that each firm must provide through operations a return on the capital employed to finance those operations. This rate of return is called the cost of capital. The rate of return is composed of the proportionate costs of borrowing and equity. The cost of borrowing is defined as the weighted average interest rate on current and capital indebtedness. Usually, only interest-bearing liabilities are included without attempts to derive implicit interest rates on the noninterest-bearing liabilities. The cost of equity is even more difficult to define but reflects the rate of return needed to attract and maintain equity funds in the industry. The cost of equity provides funds for dividends, capital appreciation and asset replacement.

(1) Standard Rate of Return

The hospital industry's cost of borrowing and cost of equity must be determined. Approximations for the cost of borrowing and cost of equity must be developed in order to implement the system. Since a detailed exception process will be available, errors in calculating the rate of return can be accommodated.

The same procedure should be used for investor-owned and nonprofit hospitals.

Hospitals with an Internal Revenue Code, Section 501(c)(3) designation will have to satisfy their tax-exempt status from the standard margin.

d. Determination of Exception Review Guidelines

The variety of hospitals and capital needs in California requires that an exception process be available. A hospital would apply for an exception when its budgeted rates exceed screens. (See Sections H and I for a discussion of exception review procedures.) Because the screens evaluate operating and capital costs, an exception request for additional capital costs would trigger a review of total costs. Within the total financial requirements, a hospital could be seeking an above-screen rate due to either operating or capital requirements.

When a hospital can demonstrate that the standard margin provided by the rate of return would be inadequate, exception may be granted. The exception procedure is part of the screening process. The screening process screens hospitals against an overall cost per discharge screen and more detailed rates.

The standard margin (standard rate of return times patient care assets) is an actual cost to the hospital and not subject to negotiation. When completing the budget for rate review, a hospital will include all capital costs in its proposed rates.

Exceptions above the standard margin would have to satisfy either (1) or (2) below:

(1) When the requested excess above margin is included in the rates, the hospital must still pass the inclusive unit cost (or functional areas) screen (see Section B.4 above). The hospital could increase specific rates to median levels (relative to its peer group) or allocate the costs to all rates, which must pass the screen. When specific services bear on the excess margin, only those rates below screens can be raised and only to the limit of the screen.

(2) The excess requested is for an expenditure that would result in a future cost efficiency and expansion.

The burden of proof will be on the hospital to demonstrate the project savings. When an exception is requested, final analysis will be manual and consist of a review of a complete budgeting package:

(1) Operating Budget;

(2) Cash Flow Budget;

(3) Capital Expenditure Budget.

E. Quality

While an equitable and effective cost control program requires some quality indicators, development of the latter is clearly

beyond the scope of this one-year project. Early in the project an attempt was made to outline an approach that could have promise, however, preliminary work demonstrated that far more data than were readily available would be required. The proposed method is based on statistical quality control procedures used in industry.

The intent was to develop criteria and decision rules for monitoring quality of care using available data.

For each time period, the percentile value of each hospital, on each indicator (outcome) variable, will be computed holding constant a number of control (input) variables, mostly reflecting case mix (see Table 10). In a second step principal components or factor scores would be computed over the combination of all indicator variables, holding control variables constant.

Hospitals appearing below the fifth or above the 95th percentile in any single indicator variable or in the factor scores will be subjected to intensive on-site investigation to determine the source of the deviation from the norm, and to determine the directionality of the variable or factor score; that is, whether a high score is "good" or "bad" quality.

Over a period of successive iteration of such time periods there should emerge a pattern such that a certain few indicators, singly or in combinations, would provide a sensible, consistent and reliable index of overall "quality" of care.

Preliminary runs were performed using the variables indicated in Table 10. Data were obtained through the Hospital Effectiveness Demonstration Project and are the result of merging of PAS and CHDC data from 200 hospitals. Investigation of the zero-order

TABLE 10

POSSIBLE INDICATOR & CONTROL VARIABLE FOR QUALITY MONITORING

Possible indicator variables:

-	PSRO region	= PSRO
-	length of stay *	= LOS
-	percent readmission	= PERRE
-	percent admitted from OPD	= PEROP
-	percent admitted from other hospitals	= PERSB
-	percent stillborn autopsy	= PERSBA
-	percent death autopsy	= PERDA
-	percent death discharge	= PERDD
-	percent discharge against advice	= PERDAA
-	percent hospital infection	= PERINF
-	percent hospital complication	= PERCOM
-	percent surgery	= PERSUR

Possible control variables:

-	percent admitted from ER	= PERER
-	percent admitted as emergency	= PEREM
-	percent admitted as urgent	= PERUR
-	percent multiple births	= PERMB
-	percent male	= PERMA
-	percent white	= PERWT
-	percent Medicare	= PERMCR
-	percent Medi-Cal	= PERMCL
-	percent under 30 days age	= PERINF

Table 10 (cont.)

- percent over 50 age = PEROLD
- length of stay * = LOS
- number of active beds (Guide) = BEDS
- occupancy percent (Guide) = OCC
- service complexity score (Guide) = COMP
- diagnosis, principal
  - percent cancer = PERCA
  - percent heart disease = PERHD
  - percent stroke = PERST
- percent additional Dx = PERADX
- case complexity score = CACOM
- percent preop stay = 2 days = PERPO2

* Could be indicator or control variable.

correlation matrix of these variables yielded no useful patterns. This suggests further work should be directed toward analysis of the details of individual case management, which is quite an ambitious project.[27]

Thus, a quality monitoring procedure is not built into this system. Development of such will require further research. At this time, dependence will have to be placed on existing review procedures, with selection of the "best" operational system as the model.

F. Incentives

The following incentives are inherent in the proposed system.

(1) Hospitals are encouraged to perform sound planning and budgeting, recognizing that future funds will be constrained and must be used in ways to insure the long-run viability of the institution.

(2) There is the "prospective rate incentive" which encourages hospitals to live within their approved budgets to earn a surplus (or avoid losses). In this system, hospitals will be permitted to retain all savings acquired in a given budget year, provided these savings are not the result of fraud or increased volume. Likewise, hospitals would have to bear all losses, provided these losses are not the result of prespecified major unforeseen events.

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[27]For an example of such a study, see Hopkins, et al (1975).

(3) Government and other third-party payers are enabled to budget realistically through the Aggregate Expenditures Forecast mechanism and the provision of equal payment for equal service. Government budgets will not be permitted to be based strictly on fiscal considerations at the expense of necessary service requirements.

(4) The capital cost mechanism encourages hospitals to efficiently allocate their available capital resources and encourages managerial discretion on the part of hospital management. This mechanism also reduces the disincentive inherent in prospective payment systems, where a hospital experiencing savings in one year has to budget accordingly the following year. The rate of return provides a lump sum annually to be used (within reason) as management desires. (However, this surplus cannot be used on unapproved capital projects, where certificate of need is applicable.)

G. Grouping

Due to lack of sufficient data, definitive findings on grouping procedures were not obtained.

Two types of classification systems are recommended at this time. Hospitals, based on characteristics to be discussed below, will be grouped. In addition, Multiple Rate System cost centers, as specified in Section L, will also be grouped. This will be the basis of screening on inclusive unit cost (see Section B.4 above).

For early implementation, hospitals should be grouped according to a three-dimensional classification involving:

(1) scope of service;

(2) metropolitan versus nonmetropolitan;

(3) size.

Scope of service could follow the categories developed by Berry (1973):[28]

(1) basic;

(2) quality enhancing;

(3) complex;

(4) community medical center.

Locational groupings would be Standard Metropolitan Statistical Area versus Nonstandard Metropolitan Statistical Area.

Size breakouts would be as follows:

(1) less than 49 beds;

(2) 50-99 beds;

(3) 100-199 beds;

(4) 200-299 beds;

(5) 300 and above.

Grouping on the Multiple Rate System centers cannot be performed for several years.

The grouping systems should be continually tested and refined. A possible method for testing the grouping system is to investigate homogeneity of diagnosis groups within and between the various hospital groups. Using diagnostic data summarized

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[28]These groupings could be updated to conform with service categories specified under licensing regulations.

in the form of principal components or factor scores, regressions could be run using each principal component as the dependent variable and a set of independent variables relating to the grouping criteria enumerated above.

A sound grouping system is an essential component of the budget and rate screening system proposed here. Development of a sound grouping system requires substantial efforts. The system suggested here is only intended as preliminary, to enable implementation of the system on a test basis.[29]

H. Timetables for Review

Hospitals will submit budgets, developed according to prespecified procedures and formats, three months prior to the prospective year, based on six months' actual and six months' estimated data. Budget package will include:

(1) prior year's data in uniform format;

(2) current year's data in uniform format;

(3) budget data in uniform format.

Two months prior to budget submission the Rate Review Board would release its Aggregate Expenditures Forecast to aid hospitals in preparing their budget submissions. The AEF would be adopted through public meetings. To the extent feasible, relevant screening parameters (e.g., group means, cost function parameters) will be publicized at this time. The screening procedure is discussed in Section B.4 above.

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[29] Quite sophisticated grouping techniques are being developed by the American Hospital Association and the Washington State Hospital Commission. The former is limited in that it is based on AHA Annual Survey data.

Those hospitals passing the screens will be permitted to charge approved rates effective the beginning of the prospective year.

Those hospitals failing the screens will be notified one month prior to the prospective year and given the opportunity of presenting a detailed justification of their budget in an "exceptions review" proceeding. At this point, only major areas that fail screens would be subjected to detailed review. All relevant parameters will be considered (e.g., volume, case mix, intensity, input prices, quality).

If the Board accepts the reasons as justified, the budget will be approved. If the Board does not accept the justification, the hospital will be requested to modify the budget. If this fails, the hospital can request a hearing, and thereafter judicial review (see below). If these carry into the prospective year, the hospital may implement rates up to those approved in the screening process.

I. Due Process: Administrative and Judicial Review

It is intended that the rate review system afford due process of law in both its adoption and its operation. Toward this end, the following provisions are suggested.

Notice and opportunity to present opposing views are essential due process elements. Therefore, in California, all Rate Review Board rules and regulations must be promulgated in accordance with the Administrative Procedures Act, which calls for 30 days' notice of public hearings at which rules and regulations are to

be adopted. Included in the "rules and regulations" definition are any guidelines, criteria, procedures or rules not intended for internal management of the Board. Therefore, notice and opportunity to be heard are to be assured, for example, in the adoption of the rate review system, the annual Aggregate Expenditures Forecast, the screening standards, and any criteria to be used in evaluating exceptions requests. The above list is not intended to be exhaustive; the adoption of all substantive procedures (i.e., procedures other than those for the internal management of the Board) are to be promulgated in compliance with the Administrative Procedures Act. In other states, the underlying due process considerations should be accommodated in the adoption of the rate review system.

The same elements of notice and opportunity to be heard are also essential in the actual operation of the system. Therefore, the rate review system should provide a fair public hearing and an opportunity for judicial review whenever the hospital and Rate Review Board cannot reach agreement upon an appropriate rate structure.

The hearing is an administrative procedure which should be available to the hospital in the event the exceptions review process (described in H above) does not produce mutually acceptable results. Following are suggested ground rules for conducting such a hearing.

(1) In its denial of the budget, the Rate Review Board will specify reasons for denial by listing areas still in contention after the detailed exceptions review.

(2) The hospital should have sufficient time (20 days is suggested) to evaluate the denial and request a hearing. The hearing request should be in writing and should specify which items of disagreement the hospital wishes reviewed; no other issues should be considered in the hearing.

(3) A hearing date will be set by the Rate Review Board, allowing 30 days' notice to the public and to the hospital. The Board is to be responsible for arranging the publication of the notice and arranging the public hearing, which should be held in the county in which the hospital is located.

(4) The Rate Review Board staff will prepare recommendations to the Board. In doing so, the staff may solicit specific supporting data from other organizations (e.g., certified audit, Joint Commission on Accreditation of Hospitals (JCAH) reports, planning agency information, Commission for Administrative Services in Hospitals (CASH) data, Hospital Administrative Services (HAS) information, California Health Data Corporation (CHDC) information). Copies of supporting data and staff recommendations shall be provided to the hospital and the public upon request; however, patients' rights to confidentiality shall not be infringed in any disclosures to the public.

(5) Hospitals will similarly make their recommendations to the Board in writing; recommendations may be accompanied

by supporting data; and such submissions shall be available to the public to the extent patient confidentiality is not lost.

(6) Arguments will then be heard in a public meeting. The Board may leave the hearing record open to allow submission of additional documentation, but no more than ten days should be allowed for this purpose.

(7) Upon closing the record, the Rate Review Board should have sufficient time to evaluate the evidence and render a written decision. No more than 45 days should be allowed for this stage. If the Board fails to act within the 45 days, the hospital may elect: (a) To raise its rates as proposed, effective at the beginning of the budget period or the end of the 45 days, whichever is later; or (b) to await the Board's decision. If the hospital does raise its rates prior to the Board's decision, the hospital will be acting at its peril, however, and will be required to return any collections above the finally approved rate. Additionally, the hospital should bear any administrative costs incurred in processing a refund.

If the decision of the Board is in favor of the rate increase, the hospital should be allowed to increase its rates beyond approved levels for a fixed period of time to recover losses incurred since the beginning of the budget period or the date the hearing was requested, whichever is later.

After administrative review procedures have been exhausted, judicial review should be available as a right. The Project

Advisory Committee was unable to reach consensus upon the most appropriate nature of judicial review, but the following alternatives were suggested:

(1) For purposes of conducting an experiment, de novo judicial review should be available beginning at the superior court level. If the court rules in favor of the hospital, the hospital should be permitted to increase its rates beyond requested levels for a fixed period of time to recover losses incurred from the beginning of the budget period. If the court rules against the hospital, and the hospital had increased its rates (per paragraph (7) above), the hospital will be required to reduce its rate below the approved rate for a fixed period of time in order to refund any payments above the finally approved rates. (It should be noted that a general refund through lower rates is deemed administratively more feasible than a specific refund to individuals overbilled during past months.) Court costs should not be awarded the prevailing party unless there is a finding by the court of bad faith on the part of the losing party.

(2) There is a possibility that de novo review could effectively remove the rate review functions from the Board and place them in the courts; therefore, a careful evaluation of the experimental experience with de novo review is suggested. If it is found that de novo review does substantially usurp the Board's function, then an alternative should be considered which would aggrandize the administrative

review proceedings (perhaps adding a rehearing provision and effectively delegating the hearing procedures to a more independent body than the Board itself) and would change the character of the judicial proceeding to a review of the Board's exercise of its administrative discretion, rather than a de novo proceeding. If the discretionary review is deemed more appropriate, legislation should provide judicial review beginning at the appellate level rather than the trial level. The purpose of this higher court entry level is to expedite the final rate determination; it is imperative that contention of a budget be settled during the budget year to preclude overlapping controversies in the event the subsequent year's budget is also disputed.

J. Sanctions[30]

An effective regulatory program must include the ability of the State to enforce requirements that have been made in compliance with the law, regulations and prudent administrative decisions. Adequate due process, public notice and appeal process, however, are imperative as a control on the regulatory agency.

Legal provisions already exist for sanction involving licensure violations. This is in the jurisdiction of the State Department of Health.

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[30]This section is based on California Hospital Association's Effective Health Facility Regulation for California, Sacramento, 1974.

It is proposed that the State shall be authorized to impose sanctions for violations relating to:

(1) budgets and rates;

(2) certificates of need.

These sanctions ordered by the state should include:

(1) probation or suspension;

(2) loss of right to do business with the state;

(3) loss of state license or permit;

(4) fine against licensed facilities;

(5) fine against owners or corporate directors;

(6) public censure.

K. Licensing

As indicated in the above section, a close coordination between licensing, planning and rate setting is essential. Licensing is addressed in this project through two components:

(1) Scope of Service

As indicated in Section A.2, a basic hospital must be licensed to offer certain basic services. Services in addition to these (e.g., neurosurgery, cardiac care) must be justified through special permits. Issuance of special permits will be based on criteria involving: (a) community need; (b) quality; and (c) cost.

(2) Relationship of Standards and Payment[13]

As indicated in Section L, rates for specialty services and services involving expensive technology (e.g., brain

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[31]The proposed coordination between the rate and special permit depends on use of the inclusive rate structure. If this rate structure is not used, the coordination does not materialize.

scanner) must be justified by the same special permits identified above. Should a facility provide a specialty service without a special permit on a routine basis, only the basic rates will apply (e.g., the basic surgery rate would apply when neurosurgery is performed without a special permit).

L. Unit of Payment--Multiple Rate System

The proposed Multiple Rate System (see Table 12 on Page 126) outlines an inclusive per diem unit of payment according to patient service. As discussed elsewhere, it will not be possible to implement the inclusive accounting or payment systems in the short run because of the required statistical sophistication.

The Multiple Rate System is a modified inclusive rate system incorporating components of a la carte charge systems and all-inclusive per diem mechanisms. The multiple rate structure has been designed to recognize the different categories and types of hospital services. The detail and number of rates for each hospital, as proposed by MRS, represent greater charge distinction reflective of diagnosis and patient service than does the present a la carte system which emphasizes individual service (in particular, ancillary service) charges. The proposed MRS system departs from conventional charges for service in the allocation of ancillary units of service (and associated costs) to inpatient groupings. Depending on the scope of services offered by a hospital, 20-40 inclusive rates could apply to a hospital.

A streamlined a la carte charge system based on standardized units of measure within ancillary departments (see Table 11)

TABLE 11

STANDARD UNITS OF MEASURE

ANCILLARY SERVICE	UNIT OF SERVICE	CHAM NUMBER
Labor and Delivery	Number of Deliveries	7010
Surgery and Recovery	Number of Operating Minutes	7020
Surgical Day Care	Number of Operating Minutes	7030
Anesthesiology	Number of Operating Minutes	7040
Central Services and Supplies	Number of Line Items Sold	7050
Laboratories - Clinical	Workload Measurement Units	7060
Laboratories - Pathological	Workload Measurement Units	7070
Laboratories - Pulmonary Function	Workload Measurement Units	7080
Blood Bank	Units of Blood Issued	7100
Electrocardiology	Number of Procedures	7110
Electromyography	Number of Procedures	7120
Electroencephalography	Number of Procedures	7130
Radiology - Diagnostic	Relative Value Units	7140
Radiology - Therapeutic	Relative Value Units	7150
Nuclear Medicine	Relative Value Units	7160
Pharmacy	Number of Line Items Sold	7170
Inhalation Therapy	Number of Treatments	7180
Dialysis	Number of Hours of Treatment	7190

Source: California Hospital Accounting Manual

could be implemented in the short run. Specific rates, as well as total budgets, would be subject to review at this stage of implementation. The inclusive per diem rates could be implemented on a sample of hospitals prior to full implementation in the long run.

The Multiple Rate System (MRS) is explained in more detail in Appendix F. Throughout a testing phase the MRS would be further developed as:

(1) a pricing mechanism;

(2) a budgeting tool; and

(3) a hospital comparison tool.

The MRS offers substantial potential from management and regulatory perspectives. First, it provides a streamlined, cost-based rate structure tailored to rate comparisons. Second, it relates broad patient type characteristics (e.g., medical, surgical, ICU) to level of care (i.e., specialty services and advanced technology services). Third, it is consistent with state licensing requirements, enabling coordination of rate regulation and licensing regulation. Fourth, as will be suggested in Section O below, it is a valuable unit of service measure for budgeting and control. And fifth, it provides a useful planning tool in terms of costing out major program changes. While requiring a more sophisticated statistical base than currently available in some hospitals, MRS has high potential. The Multiple Rate System is only slightly beyond the state of the art in some hospitals (and well within current capabilities of most hospitals) and addresses the mandate in Section 1533d of PL 93-641 regarding inclusive rates related to patient category.

M. Apportionment

Hospital charges will be directly related to costs and established prospectively. Charges for specific services (see Section L above) will be the same for all classes and types of payers. Hospital costs would thus be apportioned among the participating third-party and self payers according to the utilization of hospital services.

N. Schedule of Payments

Any third-party payer that accounts for over five percent of a hospital's billings will be bound by a twice-monthly payment schedule: the first and the 16th or closest following working day of each month.

For all other payers, payment should be made within 45 days of billing. No discounts or penalties for fast or slow pay are anticipated at this time.

O. Uniform Budgeting, Accounting, and Reporting

The proposed prospective rate system requires a uniform reporting of costs by patient service categories (see Table 12) to provide a system of inclusive revenue/cost centers with sufficient flexibility to accommodate hospitals with different patient mixes and volumes. The data for budgeting and cost accounting in the proposed system are those reported on the California Health Facilities Commission Disclosure forms. Since July 1, 1975, acute care hospitals have been reporting their costs to the Commission in a uniform reporting format. In

TABLE 12

MULTIPLE RATE SYSTEM GROUPINGS

I.	Intensive Care
II.	Sub-acute Hospitalization
III.	Obstetrics
IV.	Acute Care: Psychiatric
V.	Acute Care: Pediatric
VI.	Acute Care: Medical
VII.	Acute Care: Surgical
VIII.	Acute Care: Nursery
IX.	Clinic: Psychiatric
X.	Clinic: Dental
XI.	Clinic: All Other
XII.	Surgical Day Care
XIII.	Radiation Therapy
XIV.	Emergency Room
XV.	Educational Programs

addition to uniform cost data, a uniform statistical breakdown of ancillary service utilization by MRS category is proposed (see PIPE Form B, Table 13).

The proposed cost accounting system uses the Disclosure cost and statistical breakdown to accumulate costs according to MRS patient service categories. The effect of this process is to translate standard departmental cost data into cost data categorized by functional output categories. Thus, the cost of producing an ICU day or stay is determined, rather than the cost of ICU room and care (meals, standard drugs, etc.) separately. The result is the development of a definable product output cost that can be compared within an institution from one year to the next and between equivalent services in different institutions. Since costs are accumulated by these output categories, budgeting is based on the same patient service categories. The starting point for developing the budgeting package would be a projection of the volume of activity in each patient service category. For example, the medical patient days would be projected. Using the historical utilization data contained in the statistical breakdown, a projection of demand for ancillary utilization by medical patients can be made.

A hospital's volume/demand projections will be subjected to a reasonableness test in the screening process (see Section B.4 above).

This method of accounting and budgeting will identify those expenses attributable to new patient services. Expenses of discontinued services will also be identified in this manner.

STATISTICAL BREAKDOWN

TABLE 13

PPE FORM 3

YEAR_____

ACTUAL ☐

PROJECTION ☐

	CODE	LEVEL	SERVICE/RATE	LABOR AND DELIVERY	SURGERY AND RECOVERY	ANESTHESIOLOGY	CENTRAL SERV. AND SUPPLY	LABORATORIES CLINICAL	LABORATORIES PATHOLOGICAL	LABORATORIES PULMONARY FUNCTION	LABORATORIES OTHER	BLOOD BANK	ELECTRO-CARDIOLOGY	ELECTRO-MYOGRAPHY	ELECTROEN-CEPHALOGRAPHY	RADIOLOGY DIAGNOSTIC	NUCLEAR MEDICINE
1	A	1	ICU														
2	A	2	ICU														
3	A	3	ICU														
4	B		Sub-acute Hosp														
5	C	1	Obstetrics														
6	C	2	Obstetrics														
7	D	1	Psychiatric														
8	E	1	Pediatric														
9	E	2	Pediatric														
10	G		Medical														
11	H	1	Surgical														
12	H	2	Surgical														
13	H	3	Surgical														
14	I		Nursery														
15	J	1	High Technlgy														
16	J	2	High Technlgy														
17	J	3	High Technlgy														
18	K		Psych./Clinic														
19	L		Dental/Clinic														
20	M		Other/Clinic														
21	N		Surg. Day Care														
22	O		Rad. Therapy														
23	P	1	Emergency Rm														
24	P	2	Emergency Rm														
25																	
26	R		Education Premium														

STATISTICAL BREAKDOWN (cont.)
TABLE 13 (cont.)

PIPE FORM B

YEAR_____

ACTUAL ☐

PROJECTION ☐

	CODE	LEVEL	SERVICE/RATE	PHARMACY	INHALATION THERAPY	DIALYSIS	PHYSICAL THERAPY	OCCUPATIONAL THERAPY	OTHER PHYSICAL MEDICINE	HOME HEALTH SERVICES	OTHER ANCILLARY					
1	A	1	ICU													
2	A	2	ICU													
3	A	3	ICU													
4	B		Sub-acute Hosp													
5	C	1	Obstetrics													
6	C	2	Obstetrics													
7	D	1	Psychiatric													
8	F	1	Pediatric													
9	F	2	Pediatric													
10	G		Medical													
11	H	1	Surgical													
12	H	2	Surgical													
13	H	3	Surgical													
14	I		Nursery													
15	J	1	High Technlgy													
16	J	2	High Technlgy													
17	J	3	High Technlgy													
18	K		Psych./Clinic													
19	L		Dental/Clinic													
20	M		Other/Clinic													
21	N		Surg Day Care													
22	O		Rad. Therapy													
23	P	1	Emergency Rm													
24	P	2	Emergency Rm													
25																
26	E		Education													
			Premium													

In addition, all capital expenditures will be projected in the required three-year capital budget. The planning agency in approving a certificate of need proposal will investigate the economic feasibility of all capital expenditures that impact on patient services (see Section A on Planning and Excess Capacity).

Appendices G and H on "Accounting for Costs" and "Budgeting" present the detail and methods for transforming historical departmental cost data into a budget based on functional patient service output categories.

Generally accepted accounting principles are to be followed when determining appropriate costs. Sections D1 and D2 on Recognized Expenses and Capital Costs, respectively, categorize the allowable costs to be incorporated in the budget reflecting total financial requirements.

Section B4, Screening Process, illustrates the method for projecting cost levels and appropriate rates. A Hospital Input Prospective Price Index has also been developed to monitor and forecast inflation in the hospital industry.

The complete hospital budgeting package for screening would consist of:

(1) Operating Budget

Total financial requirements consisting of recognized expenses and capital costs for a specified volume level will be included. Expenses will be categorized according to fixed, variable and capital costs. This budget will be subjected to the screening process.

(2) Cash Budget

Cash flows related to patient care by source and use for each month of the fiscal year will be included. Although required in the budgeting package, the Cash Budget will be reviewed only to support exception requests.

(3) Capital Expenditures Budget

(See Appendix H, Section F, for a complete explanation.)

This budget will detail all the capital costs for a minimum of three years. Uses of capital would include capitalized expenditures and economic rents, such as interest and dividends. Sources of capital would include loans, retained earnings from operations, equity issues and the Standard Margin provided by the Capital Costs mechanism.

The Capital Expenditures Budget would have to be in compliance with all planning regulations. Assuming compliance, as with the Cash Budget, it would only be reviewed to support an exception request.

(4) Detailed Variance Analysis

In the second and subsequent years, comparisons of actual and budgeted costs can be performed, as well as trends in actual costs. A variance analysis data base will permit a detailed study of hospital cost/price behavior related to volume of activity and capacity levels.

The entire budgeting package would be submitted to the Rate Review Board. In the first year, hospitals would have to submit six months of actual costs and six months of projected costs, plus the entire budget year. For example, budgets that

are reviewed for the calendar year 1977 would have to include six months' actual costs from 1976 and six months' budgeted (estimated) costs for the last six months of 1976, plus entire budgeted costs for 1977. In 1978, six months' actual costs from 1976, and six months' actual costs from 1977, last six months' budget for 1977 and budgeted 1978 would be required. In this example hospitals would have to submit budgets by September 30, 1976.

The review authority would have to review the budget and make a decision within 60 days. This would allow a 30-day period for detail budget justification by hospitals, should they desire.

Uniform hospital cost data are available from the California Health Facilities Commission Disclosure forms. Recognized Expenses and Capital Costs (see Section D above) define the costs by account numbers specified in the California Hospital Accounting Manual (CHAM) that would be allowed for reimbursement through the rates. The CHAM definitions of Natural Classification of Expenses and Chart of Accounts will be the basis of accounting.

Hospital costs will be budgeted by MRS categories rather than departments. The Multiple Rate System discussed above is a system for categorizing hospital services into an output measure of patient services. The inclusive rate categories (see Table 12 on Page 126) provide a basis for a unit of payment and a measure of productive output. The standard unit of measure will be the inclusive patient day or outpatient visit. Per diem rates will be differentiated according to patient service and day of stay. Outpatient rates would be service specific.

Since the Disclosure forms do not provide the cost data in a workable format for flexible budgeting by MRS category, a cost accounting method has been designed to restate the data (see Appendix G, "Accounting for Costs"). In summary, the cost accounting method has two functions: (1) classification of expenses as fixed and variable; and (2) accumulation of costs into the appropriate revenue/cost centers. The fixed/variable categorization is necessary for the development of volume sensitive budgets.

Accumulation of costs into the appropriate revenue/cost centers is needed for setting rates. The process starts with the California Hospital Accounting Manual (CHAM) stepdown of allowable costs to daily hospital and ancillary service centers [CHFC 704 S-1(4-74) and CHFC 7041 f-1(4075)]. Appropriate ancillary service costs are then allocated to the MRS categories according to utilization statistics. For example, the cost of laboratory tests performed on Intensive Care Unit (ICU) patients would be allocated to the ICU MRS category. This final step of accumulating costs by MRS category is a major departure from the present departmental cost accumulation.

The existing cost data, as restated by the cost accounting procedure, provide all the required expense data for developing the budget package for a hospital. Since the cost data are required by law and are clearly defined, there should be a high degree of uniformity and comparability. The statistical base for allocating ancillary service costs to MRS categories has not been uniformly implemented. By using the ratio of charges for MRS category

patients to total departmental charges (taken from patient bills) times total department costs, an interim allocation method can be implemented that does not rely on uniform utilization statistics.

The budgeting package would be developed using the historical cost data stated by MRS revenue/cost center. The procedure would be initiated by projecting the volume of service in patient days or outpatient visits for the specific MRS categories. The Operating Budget would be developed for the projected volume of service with the total recognized expenses distinguished from the capital costs. The cash budget would project cash flows and working capital requirements for the budget period. The capital expenditure budget would project capital requirements for a minimum of three years. Detailed analysis of variance would be required in the second and subsequent years to monitor budgeting accuracy, hospital performance, and forecasting accuracy. Appendix H, "Budgeting," includes the detail for developing budgets and preliminary forms for reporting.

Since budgeting by MRS category represents such a major departure from existing practice, it has been designed to be phased in over a period of time. The actual time required will depend on the resources devoted to updating and sophisticating hospital cost information systems. For the first year, budgets could be prepared on a departmental basis and the streamlined a la carte payment system could be used. During the year ancillary utilization by MRS category can be determined from patient bills to support second-year budgeting. Workshops to

assist hospitals in this task would be necessary. In the second year budgets could be reviewed according to MRS categories and a more streamlined unit of payment system implemented. In the third and subsequent years, the MRS categories could be used for budgeting and unit of payment (this assumes ongoing research on the development of uniform statistics). This phased-in approach is possible because the cost accounting method and MRS restate departmental cost data, rather than requiring totally new cost data.

III. CONCLUSION

A. General Comments

This Final Report has described efforts, both organizational and technical, conducted over a 15-month period to develop a prospective payment system for hospitals. The system recommended here is the result of input from individuals representing highly diverse interests. The recommendations are intended to provide a workable program that addresses the interests of all participants in California's health delivery system. These recommendations will not please all interests; however, taken as a whole, we believe this system contains a unique combination of features to enable consensus by affected parties and effective implementation. The participants in this project

were drawn together by a common conviction that the current regulatory system must undergo major reform to accommodate the public interest.

The system described in this report is a budget review system based on sound planning, the concept of an aggregate hospital expenditures target, the principle of equal payment for equal service and a capital costs mechanism intended to encourage optimum allocation of capital resources and sound capital budgeting.

In brief, the Prospective Incentive Payment Experiment was an attempt to design a hospital cost containment system to accommodate the needs of the various participants in the health delivery system. Government and other major purchasers are accommodated through the strong cost containment orientation of the system. Industry interests are addressed through basing the controls and rates on budgets rather than strict formulas, a broad budget screening process which permits substantial managerial discretion, and the principle of equal payment for equal service by all payers. The consumers' interests are addressed through emphasis on planning, overall industry financial viability, control on hospital rates, and equal payment for equal service.

The objectives of this project are highly ambitious and overwhelming; much too ambitious to be adequately treated within this short time frame and these limited resources. Further research is necessary to refine many of the concepts and components

introduced here. The sooner this needed research proceeds, the sooner the proposed programs and policies can be implemented and the more refined will be the programs when implemented.

Areas of needed refinement are enumerated in Section II and need not be repeated here. Some issues were not addressed in the project. Of particular concern on the part of industry representatives is the need to preserve incentives for philanthropic contributions. These incentives are often compromised through reimbursement and planning regulation. It is project staff's opinion that through a combination of the capital cost mechanism, the broad budget screening process and the cost containment emphasis, the proposed system does in fact preserve incentives for philanthropy and endowments. An apparent disincentive results from the planning mechanism, requiring that all expansions and major capital expenditures receive certificate of need approval. In a well-planned hospital economy, philanthropic contributions will likely shift toward direct support of patient care services and away from capital-intensive expenditures. The philanthropic issue is an important one, deserving further study by industry groups.

Another issue of concern to industry representatives involves establishment of a mechanism enabling private-paying patients to purchase health services and amenities above those consistent with the Aggregate Expenditures Forecast. This is a controversial issue involving judgments regarding appropriate standards of care, the concept of "mainstream" care, notions of "economic freedom" and so on. Undoubtedly, a market for

such services will emerge under a regulated system; however, development of such a mechanism is clearly beyond the scope of this project.

B. Summary

This report presents a proposal for a comprehensive regulatory system for hospitals focusing on aggregate expenditures and the coordination of planning and licensing with budget and rate review functions. The proposed system provides a mix of incentives that does not exist in other current or proposed systems.

This system reflects the general consensus of an advisory committee drawn from major health care delivery interests in California. It combines the attributes of a strong cost containment strategy with fair payment by all payers, payment to hospitals based on their individual budgets, treatment of nonprofit and investor-owned hospitals in a similar manner, a capital cost procedure that encourages hospitals to budget and plan from a cost effectiveness standpoint and a largely computerized screening system enabling review of a large number of budgets with a minimum of staff time.

Given the relatively short project period and the highly ambitious project goals and scope of work, further refinements in the resulting methodology are advised. While this recommendation is stated throughout the document, it deserves special attention to emphasize the formidable task of developing an effective and equitable cost containment program that is acceptable to the myriad of interests in the health delivery system.

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